Environment and Subsistence in Medieval Europe

Papers of the 'Medieval Europe Brugge 1997' Conference
Volume 9

edited by
Guy De Boe & Frans Verhaeghe

I.A.P. Rapporten 9

Zellik
1997

I.A.P. Rapporten

9

I.A.P. Rapporten

uitgegeven door / edited by

Prof. Dr. Guy De Boe

Environment and Subsistence in Medieval Europe

Papers of the 'Medieval Europe Brugge 1997' Conference
Volume 9

edited by
Guy De Boe & Frans Verhaeghe

I.A.P. Rapporten 9

Zellik
1997

Een uitgave van het

Published by the

Instituut voor het Archeologisch Patrimonium
Institute for the Archaeological Heritage

Wetenschappelijke instelling van de

Scientific Institution of the

Vlaamse Gemeenschap
Departement Leefmilieu en Infrastructuur
Administratie Ruimtelijke Ordening, Huisvesting
en Monumenten en Landschappen

Flemish Community
Department of the Environment and Infrastructure
Administration of Town Planning, Housing
and Monuments and Landscapes

Doornveld
Industrie Asse 3 nr. 11, Bus 30
B -1731 Zellik - Asse
Tel: (02) 463.13.33 (+ 32 2 463 13 33)
Fax: (02) 463.19.51 (+ 32 2 463 19 51)

DTP: Arpuco.
Secr.: M. Lauwaert & S. Van de Voorde.

ISSN 1372-0007
ISBN 90-75230-10-9
D/1997/6024/9

was organized by
werd georganiseerd door
fut organisée par
wurde veranstaltet von

Dominique de Moulins
Anton Ervynck

Preface

Over the past decades, archaeozoological, archaeobotanical, archaeoethnobotanical and other types of archaeo-environmental work has gradually become as standing feature of archaeology, a discipline which already owes so much to what has been called the 'earth sciences' and notably to soil science, geology and climatology. Nature and environments – as well as their development – are legitimate and indeed unavoidable issues in archaeology as any prehistorian will readily admit. It would seem that the archaeologists working on medieval and early modern times have been somewhat slower to adopt the same attitude, not only because their discipline has developed only fairly recently but quite probably also because of other factors as well. Thus for instance, part of the field has already been preempted by traditional historical geography part of which has evolved into environmental history over the last ten years. In addition, the agendas set by traditional history and by the pressures of rescue work have not always helped and may be partly responsible for medieval and later archaeology somewhat lagging behind as compared to, for example, prehistoric archaeology.

Another problem is that related to interdisciplinarity and multidisciplinarity. Much of the environmental work is carried out – as it should be – by specialists trained in the natural sciences and in its techniques and approaches. Much of the detailed work on environmental evidence therefore often is somewhat obscure to many (medieval and later) archaeologists, quite a few of whom have been trained in the humanities and feel uncomfortable with natural sciences, mathematics and statistics. In addition, many archaeologists have their own 'traditional' agendas and priorities (from pottery and buildings to settlements and settlement patterns) and for a long time tended to consider specialist work on environmental issues as less directly relevant. Even the retrieval of the evidence from its stratigraphic context remained fairly often a very low priority. In many other cases, all this also led to the well-known 'appendix-syndrome': specialist reports were included at the end of the final report and/or publication, which thus gained in apparent 'scientific' and 'modern' stature. But the results of the specialists' work was hardly integrated into the archaeological discussion of the evidence. Understandably, this did not help to endear archaeology to many natural scientists and environmentalists. In all fairness, it should be admitted that the reverse also occurred and that some environmentalists kept very strictly to their own specialized field, hardly professing any interest in the archaeological debate. Luckily for archaeology as a whole and notwithstanding a few lingering 'hard cases', this type of behaviour is rapidly becoming known for what it is: obsolete and unscientific in the full sense of the term.

Neither should it be forgotten that what is now often called 'environmental work' has been demonstrated to be much more important to archaeology as a whole than the study of the natural environment (soils, plants and animals). It touches upon literally most if not all fields of interest in archaeology: material culture, the production of commodities, provisioning, economy, technology, food and consumption patterns, social behaviour and many more, up to and including leisure (as with games, toys, and even the budding field of archaeology of gardens). And in turn, all this is of course of the utmost importance to understanding the social and behavioural patterns of humans in the past (and present). This simply means that 'environmental archaeology' cannot but be a full-fledged, fully integrated and equal partner of archaeology. At the same time, it is also a provider of absolutely essential information which is otherwise inaccessible.

For all these reasons, the organizers of the MEDIEVAL EUROPE BRUGGE 1997 international conference of medieval and later archaeology (1 - 4 October 1997) decided to introduce the subject as a special section of the conference. This section was organized by Dominique de Moulins (GB, English Heritage, London) and Anton Ervynck (B, Institute for the Archaeological Heritage, Zellik) under the general heading 09 ENVIRONMENT AND SUBSISTENCE – ENVIRONNEMENT ET SUBSISTANCE – UMWELT UND LEBENSUNTERHALT – MILIEU EN LEVENSONDERHOUD. Originally, the plan was also to include lectures by 'environmental archaeologists' in the other sections of the conference in order to emphasize not only the importance of this type of work and the many ways in which it can and does contribute, but also the need for a consistent and full-fledged integration of *all* the evidence available to us. Unfortunately and following the withdrawal of a few specialists, the offer of papers was somewhat too limited to carry this through systematically.

The present volume offers a collection of preprinted papers, a number of which were presented orally and debated during the sessions of section 09. Unfortunately, a number of contributors to this section did not submit a text in time for inclusion in the present volume while other colleagues could not attend and present their contribution. This explains why the general structure and the contents of the present volume do not conform exactly to the original programme of the conference. The volume has been organized keeping in mind both the complexity of the subject and the general lines of the structure of section 09 of the conference as proposed by the organizers. This means that the contributions in the present volume have more or less been grouped according to the following topics:

- Papers on archaeozoological remains as evidence for economic situations and developments, food consumption patterns and related behavioural patterns have been brought together under the heading *Animals, economy and diet.*
- The botanical evidence related to the same subject is commented on by the papers included in a parallel section with the title *Plants, economy and diet.*
- Papers related to specific projects, case-studies and issues where archaeozoological and archaeobotanical work plays a major part have grouped under the heading *Food and Medieval environments.* This section also includes papers which emphasize and illustrate the potential and the need for the study of specific sources of archaeo-environmental and archaeological 'indicators' such as soils and mites.

The present volume of course does not do justice to the many and complex issues involved. Nor does it provide a complete overview of the results attained and knowledge acquired. Quite a few other potential archaeo-environmental 'indicators' of a specific type seem largely absent, though some of them were represented in the contributions presented orally at the MEDIEVAL EUROPE BRUGGE 1997 conference. Nevertheless, the 20-odd papers included in the present volume provide an idea of the present state of the question in these fields. Taken together, they also illustrate the major impact of natural sciences of an environmental nature on all aspects of the archaeology of medieval and early modern times and this is in keeping with the basic philosophy of the MEDIEVAL EUROPE conferences that none of the subjects and topics of interest to medieval and later archaeology can rightfully be divorced from one another. In fact, quite a few of the contributions presented in the context of the other sections of the conference often draw also on the environmental evidence. This is definitely the case with the papers in section 06 (Rural Settlement), but also with those in sections 07 (Material Culture), 10 (Method and Theory) and 02 (Death and Burial) of the conference. In addition, some of the papers included here are directly related to the urban environment and consumption patterns (sections 01 and 07). In itself, all this may well be a good sign reflecting the growing interest in environmental work and more importantly, the progressively improving integration of environmental work and archaeology. It is also interesting to note that many of the papers presented here pay at least as much attention to the interpretation (in archaeological and historical terms) of the environmental evidence as to the analysis and presentation of the actual data, thus moving away from the 'old-fashioned' specialist report and wilfully participating in the archaeological and historical debate.

All this is as it should be, even if the trend needs to be strengthened to the profit of archaeological knowledge.

Frans Verhaeghe & Guy De Boe

Arturo Morales Muñiz

Filling the Pots: What can or can't Environmental Archaeology do for our Understanding of the Medieval World?

Abstract

More than a question of names, environmental archaeology is a question of scope and aims but, above all, a cooperative task. The present paper briefly explores some of the possibilities of this science while highlighting theoretical issues with the aid of specific analyses carried out on the fauna and flora of various European medieval sites.

Introduction

The development of science brings along, as two of its more pervasive consequences, a progressive overspecialization of research and shifts in focus which, if carried to their utmost extreme, eventually end up replacing old paradigms. Both phenomena are simply the outcome of the gradual accumulation of knowledge through time as well as the incorporation of new and more refined techniques into the research effort.

Progressive overspecialization is, thus, an inescapable strategy in the 'adaptative game' of research and researchers and, as such, it can be considered both a blessing and a curse. The main problem with overspecialization is that questions, the motor of our scientific engine, do not normally 'impinge' upon a single discipline but rather fall in-between two or several of these (Fig. 1). If we try to straightjacket a particular question into a particular discipline chances are that not all aspects of that question will receive a homogeneous treatment or even any treatment at all. To deal with such matters adequately in a compartmentalized scientific world, if we all agree that questions should be given primacy over data, we have to recur to pluridisciplinary approaches.

Archaeology, traditionally conceived as the science of 'pots and stones' has not been alien to these currents and, in the past fifty years, has witnessed a particularly dramatic proliferation of disciplines from mathematics and the physical sciences to the

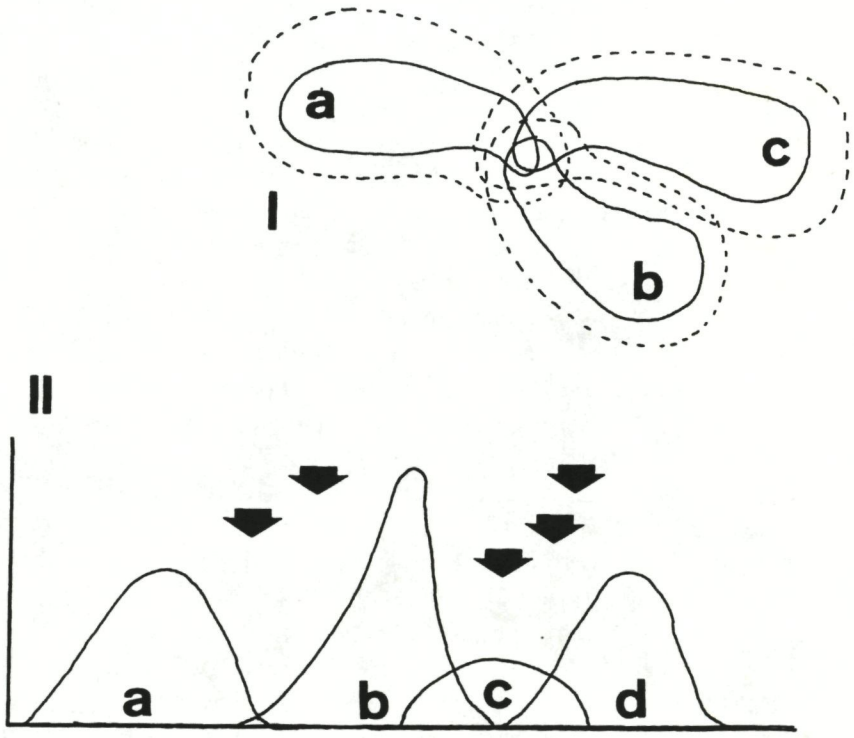

Fig. 1. - *Aspects of multidisciplinar research (A, B, C, D: research fields). (I) A scenario of overlapping disciplines (black lines: factual data; dotted lines: guesses/hypotheses). If specialists share hard data only they stand smaller chances of providing colateral feedback to other colleagues. When also soft data is shared the overlapping among the different disciplines increases dramatically and so does the chance of solving multi-disciplinar problems.*
(II) Questions (arrows), in particular complex ones, do not normally impinge upon a single discipline but, instead, tend to fall in-between several of these. The further a discipline becomes specialized (i.e., the higher the peak gets) the smaller the chances it stands of being able to deal with complex questions in isolation.

Fig. 2. - *The classical prototype of cultural archaeology (Courtesy IAP)*

natural and anthropological sciences which, more often than not, resulted not only in an isolation of disciplines and researchers but, more dangerously, of scope and goals. In particular, that branch which we now call environmental archaeology (EA from here onwards) and which *'views the human animal as part of the natural world interacting with other species'* (Renfrew & Bahn 1991, 195) has in too many instances developed without the desirable degree of integration with its mother, 'cultural (ie., traditional) archaeology' (CA from here onwards).

Despite a long tradition dating back to the works of Reinhardt (1822), Steenstrup (1841) and Rütimeyer (1861) (the term 'zoologico-archaeologist' having been actually coined by Lubbock in 1865!), EA has been slow in systematically incorporating itself into CA. In the case of European medieval archaeology, one can properly consider this incorporation a post-World War II phenomenon and also one which does not seem to have elicited a particularly enthusiastic response (it is disappointing to recall, for example, that in the 1992 Medieval Europe conference held at York no session was devoted to EA and, apparently, no effort was made to invite environmental archaeologists). Even today, the status of EA within Europe is widely heterogeneous with countries like my beloved Spain still existing where traditional archaeologists only reluctantly concede us the status of an 'auxiliary science'! (Morales 1993).

EA is not a revolutionary phenomenon within archaeology but, rather, a science which aims at complementing and refining the reconstruction of the past, the main goal of CA, in ways which are not necessarily linked to the human scheme of things. It is basically a shift in focus which gives other organisms and natural phenomena the chance to feedback some input into an otherwise strictly anthropological system. If we are allowed a somewhat naive analogy, we could say that if CA aims at retrieving and interpreting the pots, then EA aims at filling those pots with the substances they were originally meant to hold and also with other items that might occasionally hitch-hike along the way, often as undesirable or unnoticed guests (Fig. 2).

Filling The Pots: From Theory To Fact

Set within such an pluridisciplinary framework, one must stress that filling the pots is no straightforward task. This is so because the range of questions, quantity and quality of data and, above all, the levels of cooperation between EA and CA vary widely.

For this reason, in order to illustrate some of the theoretical issues with specific case studies, we would like to propose to the readers a somewhat peculiar mental exercise and follow the various ingredients of an 'impossible recipe', found in one particular pot, along different interpretative scenarios. While doing so, we will enumerate the four main outcomes of the interaction between EA and CA, namely either one leading the way and the other following, or EA and CA either complementing or contradicting each other.

So what's our 'impossible recipe'? Pork goulash in fish sauce!

EA and CA contradict each other: the Visigoth's pig as a 'bone of contention'

If the reconstruction of diets is one of the immediate aims of archaeozoology, the next inferential level of analysis is that of stock-breeding reconstruc-

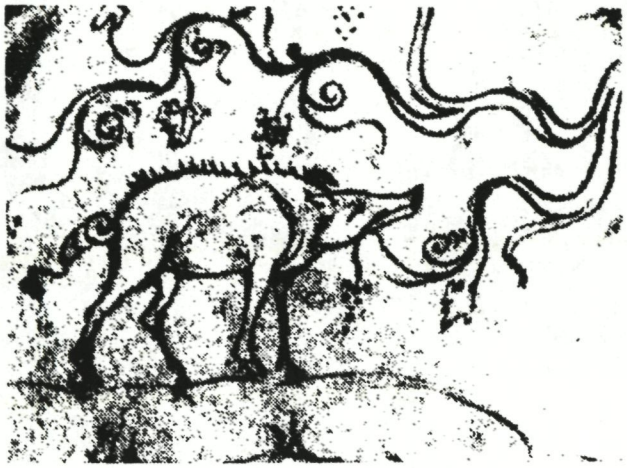

Fig. 3. - *Early medieval pig, as depicted in the 8th C. psalter of Utrecht.*

tion. It so happens that shifting from proximal to ultimate causes might often imply a gap too wide to bridge. Medieval archaeologists often have the possibility of making use of documentary evidence (a possibility with negative connotations for, 'if it is already stated in the records why bother substantiating claims with the extra effort of studying organic remains?') but one should beware of taking written records at face value for these might occasionally be quite misleading. This concern impinges directly upon the first and main ingredient of our 'impossible recipe'.

The importance of pig husbandry during the invasion period of Spanish history (i.e. Visigoth times) has been repeatedly sustained on two grounds: (a) legal documents, such as the *Lex Alemannorum*, specifying the interest of these flocks and the status granted to their keepers (Fructuosus 1971; Riu *et al.* 1982) and (b) assumptions concerning the collapse of the rural world and concomitant spread of woodlands after the fall of the Roman empire (Ladero 1987; Orlandis 1988; García 1989); such woodlands, on the basis of actualistic and historical data (including pictorial; Fig. 3) seem to have been a *conditio sine qua non* for the flourishing of a semi-intensive to extensive pig breeding practice in Iberia and made possible the Germanic tribes' putative desire for pork. That this scenario might be suspect at some point can be inferred both by the level of consensus reached by historians and archaeologists alike and by the existence of a few dissenting voices (eg. Fernández Galiano 1975). Above all, the absence of a rigorous survey of the material evidence requested a more thorough analysis of such state of affairs.

Morales (1992) tried to substantiate these claims on archaeozoological grounds and, despite inherent limitations of her data base, came up with the following conclusions (Fig. 4):

Table 1
Oscillation in the contribution of the main domesticated stocks (expressed as ranges in the percentages of the corresponding number of remains) in Roman and Visigoth sites from the Iberian Peninsula (taken from Morales 1992).

	Cattle	Ovicaprines	Pig
Roman	7 - 59.5	19 - 77	4 - 71
Visigoth	11 - 22	61 - 77	8 - 15

1. The very few Visigoth sites in Spain happen to exhibit a particularly low contribution of pig remains when compared to Roman sites (greater domestic stock fluctuations in the latter might correlate with higher number of cases and sample sizes and also reflect a greater range of geographical and contextual scenarios!) (Table 1).
2. In the only case where an uninterrupted sequence from Roman to Visigoth times exists (i.e. the site of El Burgalés, Fig. 4) the contribution of pig to the domestic stock spectra evidences a stark decrease from 25 % of the NISP to a mere 15 % in the latter period.

Obviously, both conclusions are open to debate and more data is needed to further corroborate the patterns but the results of Morales' analysis do seem to be in open conflict with the documentary evidence available and stress the point that if the possibility exists for a pattern to be substantiated through alternative lines of evidence such possibility should always be explored. Perhaps ovicaprines have been, after all, the modal stock-breeding subjects throughout Iberian history and our pork goulash only constituted the favourite dish of the Visigoth landlords but was certainly not the way to learn about the culinary preferences of the population at large!.

CA yields data and provides understanding: Coppergate's plants contribution to the goulash

A certainly naive conception of excellence tends to equate quality with quantity. Both EA and CA testify that this is often not the case.

Ever since systematic sieving and flotation of archaeological sediments became a routine, meat goulashes started to turn dangerously into vegetable hotchpotches and our ideas about diets in the past had to be thoroughly reframed.

The problem with plant remains is not one of quantity but rather of quality. A series of contingen-

Table 2
Plant remains from Anglo-Scandinavian contexts (n=398) from Coppergate (York, UK) that could represent consumed species. The remains are subdivided in groups of different certainty of interpretation (Taken from Kenward & Hall 1995).

TAXON (identification unit)	No. contexts	%	Vernacular name
A. Primary evidence: the remains found are the plant parts consumed as food or with food			
CEREALS AND PULSES			
Avena sativa (charred grains)	29	7.3	cultivated oats
— (uncharred grains)	1	0.3	
Triticum aestivo-compactum (charred grains)	179	45.0	bread wheat
Triticum sp(p). (charred grains)	11	2.8	wheat
Triticum/Secale (periderm ('bran') fragments)	82	20.6	wheat/rye
— (uncharred grains)	19	4.8	
Vicia faba (charred seeds)	29	7.3	field bean
— (uncharred hila)	3	0.8	
— (uncharred testa fragments)	7	1.8	
FRUITS			
Crataegus monogyna (seeds)	47	11.8	hawthorn[1]
Ficus carica (seeds)	3	0.8	fig
Fragaria vesca (achenes)	1	0.3	strawberry
Malus sylvestris (seeds)	169	42.5	apple
— (endocarp)	142	35.7	
Prunus Section *Cerasus* (stones)	18	4.5	cherry
P. domestica sensu lato (stones)	90	22.6	plum, bullace
P. domestica ssp. *insititia* (stones)	14	3.5	
P. spinosa (stones)	233	58.5	sloe
Rosa sp(p). (seeds)	22	5.5	rose (hips)[1]
Rubus caesius (seeds)	8	2.0	dewberry[1]
R. fruticosus agg. (seeds)	182	45.7	blackberry[1]
R. idaeus (seeds)	42	10.6	raspberry[1]
Sambucus nigra (seeds)	316	79.4	elderberry[1]
Sorbus aucuparia (seeds)	12	3.0	rowan[1]
Vaccinium sp(p). (seeds)	29	7.3	bilberry, etc.[1]
Vitis vinifera (seeds)	8	2.0	grape
LEAF VEGETABLES / POT HERBS			
Allium cf. *porrum* (leaf fragments)	18	4.6	?leek
HERBS / FLAVOURINGS			
Anethum graveolens (fruits)	85	21.4	dill[2]
Apium graveolens (fruits)	140	35.2	celery[2]
Coriandrum sativum (fruits)	16	4.0	coriander[2]
cf. *Foeniculum vulgare* (fruits)	1	0.3	?fennel[2]
Satureja hortensis (nutlets)	105	26.4	summer savory
OIL SEEDS			
Linum usitatissimum (seeds)	183	46.0	linseed
Papaver somniferum (seeds)	31	7.8	opium poppy
B. Secondary evidence: (a) the remains found are not the parts eaten			
CEREALS/PULSES			
Vicia faba (pod fragments)	1	0.3	field bean
LEAF VEGETABLES / POT HERBS			
Chenopodium bonus-henricus	4	1.0	good King Henry[3]

HERBS / FLAVOURINGS			
Humulus lupulus	201	50.5	hops[4]
Myrica gale (fruits)	3	0.8	bog myrtle[4]
— (leaf fragments)	2	0.5	
OIL SEEDS			
Linum usitatissimum (capsule fragments)	55	13.8	linseed
NUTS[5]			
Corylus avellana (nuts & nutshell fragments)	323	81.2	hazel nut
Juglans regia (nutshell fragments)	12	3.0	walnut
ROOTS			
Daucus carota (fruits)	17	4.3	carrot
Pastinaca sativa (fruits)	19	4.8	parsnip
B. Secondary evidence: **(b) the remains found are not identified closely enough**			
CEREALS/PULSES			
Avena sp(p).	93	23.4	oats (wild/cultivated)
Cerealia indet.	43	10.8	cereals
B. Secondary evidence: **(c) the remains found are not the part eaten *and* are not identified closely enough**			
LEAF VEGETABLES			
Brassica sp(p). (seeds)			

Notes
1:Some or all of these small seeds may have reached the site by natural dispersal, e.g. via birds
2:The fruits could be included under 2(a) as secondary evidence for the leaves used as herbs/vegetables
3:Probably wild-growing and not used at all for food
4: These have one or more other uses and may not have been used as flavourings
5:It seems very unlikely that these are anything other than food remains!

cies determine to what extent a particular taxonomical sample is representative of a particular diet so that one might aptly refer to 'uncertainty levels' in the identification and interpretation of archaeobotanical collections. The case of the extensive plant samples from the Coppergate site in York can be considered paradigmatic from such standpoint (Kenward & Hall 1995)(Table 2). Being a waterlogged collection at least eliminates the biases of charred deposits, which favour the retrieval of remains likely to resist contact with fire (e.g. seeds and nut shells); still, the plants from Coppergate are not devoid of interpretative drawbacks. Thus, for one thing, one has to distinguish between primary evidence (i.e., when the remains found are the plant parts consumed as food or with food) and secondary evidence. For most plants, only one particular portion is of use (e.g. fruits) but there are cases when two or more portions turn out to be of use (e.g. field bean, *Vicia faba*) (Table 2). Even in the case of primary evidence, many remains may have reached the site by natural dispersal. In the case of Coppergate, for example, it is quite possible that all of the fruit seeds, except for those of figs, apples and grapes, were incorporated in the sediments via birds! (Hall, pers. comm.). The problem is that, at present, we have no reliable way of sorting plant remains into taphonomic groups as is routinely done with animals (Gautier 1987) and taphonomic heterogeneity often prevents archaeobotanists from making too strong statements concerning dietary habits even under optimal circumstances.

In the case of secondary evidence, we have to consider several levels of uncertainty which, proceeding from the more to the less informative, are as follows: 1) The remains are not the parts eaten/consumed. In connection with this statement one still has to stress that not all remains in this category are equally informative, degrees of uncertainty existing within them as well. Thus, for example, although in the case of nuts the only remains retrieved at Coppergate were nutshell fragments (Table 2), it seems safe to assume that we are dealing with food items. The pod fragments from the field bean, on the other hand, seem to fall clearly at the other side of the spectrum but still have some chances of standing as 'food items' (i.e.

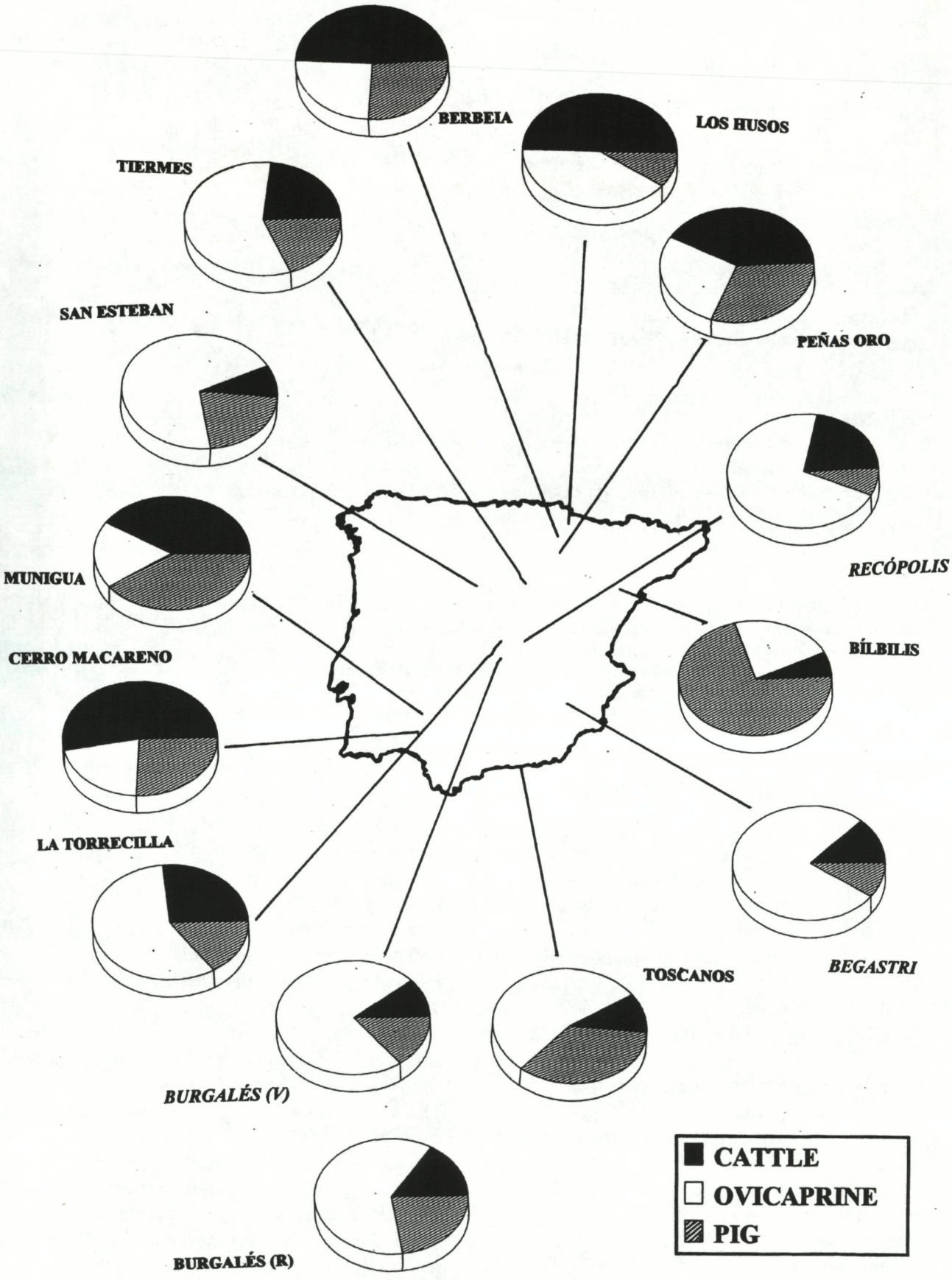

Fig. 4. - *Contribution of the main domestic stocks in the overall composition of consumption refuse from roman and visigoth (italic) sites in the Iberian Peninsula (Taken from Morales 1992)*

charred seeds, hila and testa fragments have also been identified in the deposits; table 2A). Finally, we have remains of taxa with no counterparts in the primary evidence list and which seem unlikely to have growing plants). In connection with these comments one needs to recall that, even with plants which have been consumed as human food, one needs to consider alternative, non-culinary, uses such as dyes, medicines, scents, magical properties, etc. (actually, one of the main problems encountered in establishing the role of wild taxa is the multiplicity of uses that a single species may have had!).

2) The remains are not identified closely enough. This might be so due to poor preservation conditions, lack of diagnostic features, or, occasionally, poor reference collections. At Coppergate, only a few cereal grains had to be left at generic or family level and their contribution to the total sample is so limited that the overall picture is barely affected. But at many other sites this has not been the case (Hall 1986).

3) The remains found are not the parts eaten and are not identified closely enough. This is obviously the worst possibility, more so if it affects an important taxon. At Coppergate, for example, we have in this category the genus *Brassica* which, on top of other important plants such as turnip, incorporates one of the main staple foods of medieval Europe: cabbages (Table 2 B.C). The exclusive retrieval of seeds (in cabbage, the edible parts are leaves), of impossible diagnosis beyond generic level, prevents us from making any meaningful statements concerning one of the presumably main ingredients of our goulash!

Uncertainty levels could, in theory, be pushed still one step down the ladder by incorporating what archaeobotanists dub 'missing foods' (i.e. plants which contributed to the diet or to the living at a particular site but have left no remains for one reason or another). Gathering of wild plants, for example, was surely a common activity in the past and included many species for which evidence is not provided by the archaeological record. For all these reasons at any one site, interpretation of the array of plant foods consumed and plant products used is never complete. CA yields data but EA does not provide as much understanding as one would expect. Understanding, if it is to be as complete as possible, needs the concourse of CA which defines contexts, cultural backgrounds (e.g. in medieval Spanish cities by identifying Christian, Moorish and Jewish quarters) and similar matters. At the same time, the ethnobotanical literature provides both data as well as a background to test hypotheses, etc. In short: a deep degree of interaction with EA if the goulash's vegetal component is to be understood in a holistic, fruitful manner!

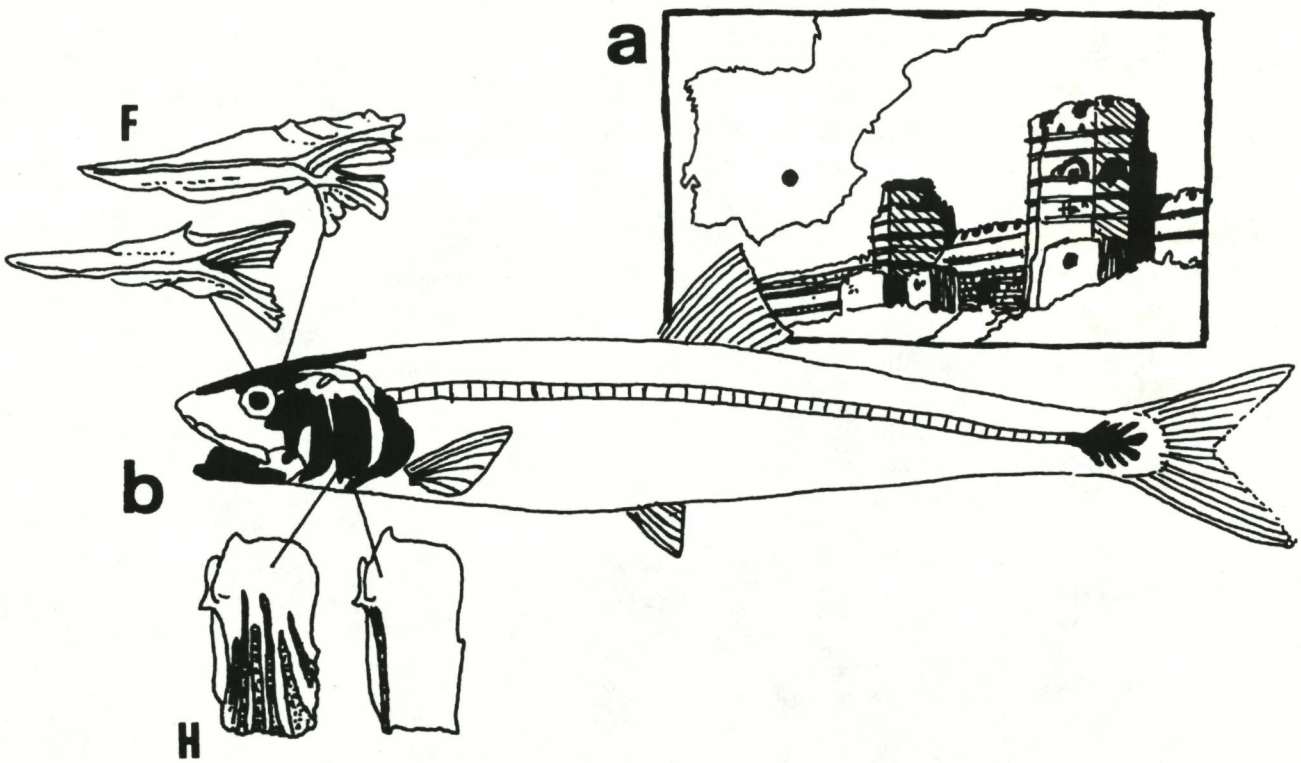

Fig. 5. - *Clupeids from Calatrava la Vieja (Ciudad Real, Spain). A. Location of the site. B. Outline of a sardine skeleton with the remains retrieved at the site shown in black. Osteological differences between sardines and sardinellas are evident in all bones including frontals (F) and opercula (H) (Taken from Roselló & Morales 1991).*

EA and CA complement each other: fish frauds at Calatrava la Vieja?

Certain ingredients of our goulash, such as condiments, might not be easy to track down unless a close cooperation exists from the start between people working in CA and EA. Fish sauces or food frauds, for example, constitute secondary, even anecdotal, elements of diets and only close scrutiny and a keen eye might eventually spot them at archaeological sites. The implications which some of these trivial issues bear on the economy of a particular people might not be apparent at once but our experience has taught us that, occasionally, such implications might be far broader in scope than previously assumed.

The almohad (i.e. 12Ith-century AD) site of Calatrava la Vieja (South Central Spain; Fig. 5) harboured one such unexpected item. When the fish remains from a dumpyard next to its defensive wall were analyzed (Roselló 1989; Roselló & Morales 1991), a large fraction of these were found to belong to clupeids (i.e. herring-like fishes) indicating the existence of a regular trade of coastal goods, probably through the Guadiana river (Roselló 1993; Lentacker 1994; Morales *et al.* 1994). This claim has been simultaneously substantiated on archaeological grounds (Macias 1996), together with the fondness of moorish peoples for fish (Díaz 1978-79; García 1978). The surprise came when we found that a full half of the clupeids turned out to be from round sardinella (*Sardinella aurita*), a low-quality meat fish which has never been retrieved on Iberian sites (Roselló, 1989) while the other half belonged to sardines (*Sardina pilchardus*), a highly priced species throughout Spanish history.

The case for a putative fraud gained ground on an actualistic basis. Although normally commercialized as fishmeals or fertilizers, sardinellas are ocassionally marketed fresh in southern Spanish cities as 'sardines' but are only sold to unexperienced customers (e.g. tourists) for despite external similarities between both species, local people are always able to spot the specific differences (e.g. the lack of striations on the operculum from sardinella but a distinctly visible yellow stripe on the flanks) (A. Morales, personal data).

Two further lines of evidence were combined in this quest to confirm the fraud:

1) Both contextual and taphonomic data indicate that clupeids reached the site as *stockfish* (i.e., dried and salted) and the skeletal representativity spectra evidence the accumulation of dried bony head and tail parts (Fig. 5). Under such circumstances, the possibilities of commercializing sardinellas as sardines greatly increase for not only are the animals more difficult to set apart but also the differences in the quality of their meat diminish.

2) An exhaustive quest through documentary data, from legal documents to recipe books, failed to

Table 3
Producer-indicating species of gamasid mites (Acari = Gamasida) for the excrement of the main taxa of domestic animals (Taken from Schelvis 1992c).

Cattle-Indicating species (N=5)	**Pig-indicating species (N=4)**
Macrocheles vernalis	*M. merdarius*
M. pavloskii	*Ameroseius delicatus*
Haemogamasus pontiger	*Gamasodes bispinosus*
Parasitus talparum	*Parasitus* type R20a
Uroobovella crenelata	**Poultry-Indicating species (N=9)**
Sheep-Indicating species (N=4)	*Holostaspis heterosetosa*
Halolaelaps type R21A	*Amblyseius obtusus*
Dendrolaelaps strenzkei	*Rhodacarus coronatus*
P. consanguineus	*Uroseius degeneratus*
P. hyalinus	*Trichouropoda posnaniensis*
Horse-Indicating species (N=7)	*T. ovalis*
M. insignitus	*T. longiovalis*
D. stammeri	*N. breviunguiculata*
Pergamasus vagabundus	*Discourella cordieri*
P. eta	
Nenteria stammeri	
U. varians	
U. difoveolata	

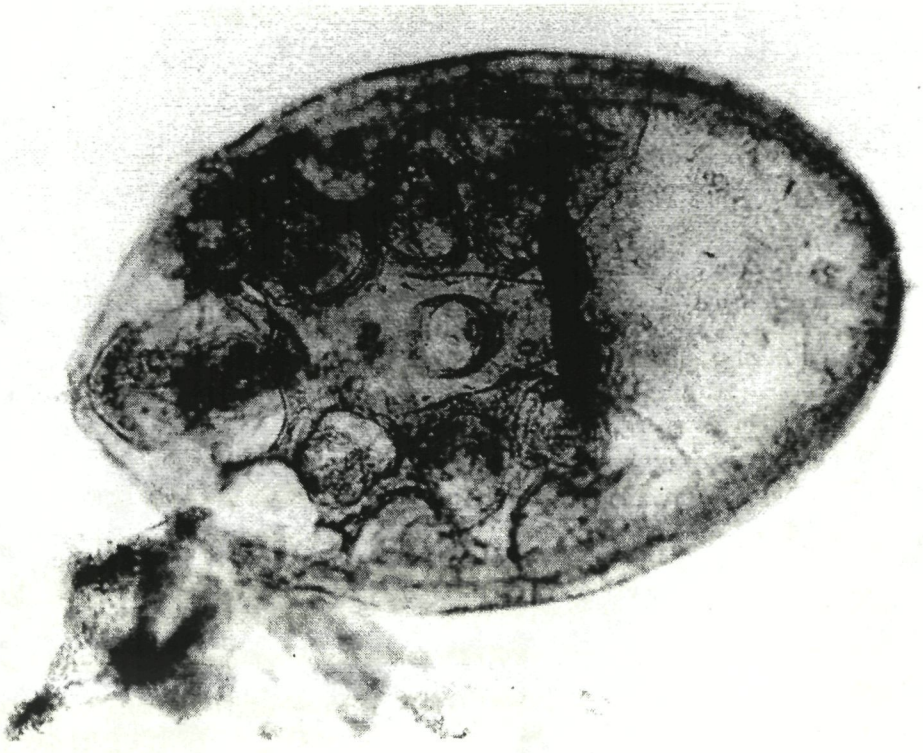

Fig. 6. - *Producer-indicating gamasid mite from horse dung samples retrieved at Martinikerkhof*: Uroobovella difoveolata *Hirschmann & Zirngiebl-Nicol 1962 (Courtesy J. Schelvis, ScaraB)*

retrieve any hints of fishing, consumption or alternative uses for sardinellas in Moorish Iberia (Malpica 1984; Elexpuru 1994; Marin & Waines 1994; Rubiera Mata 1994). As a matter of fact, not even a name seems to have been used for the species, with the present day Moroccan one ('Latcha') being a direct translation of the Spanish 'alacha' (Bianchi 1984; Malpica & Barceló, both verbal communication). In view of the amount of Arab names available to describe different kinds of both sardines and anchovies (*Engraulis encrasicholus*) in the texts, one should assume that this 'negligence' is due to disinterest rather than lack of knowledge.

Obviously, all this evidence remains at a purely circumstantial level of inference. Despite this, it should be clear that the case for nailing down such subtle phenomena as food frauds in the archaeological record can only be done through a close cooperative work among the different specialists involved in the project.

EA yields data and provides understanding: the analysis of archaeological dung

Having reached this stage, one might as well proudly think of oneself as a famous *chef de cuisine* acquainted with all the subtleties needed to produce the world famous 'Medieval goulash'. But beware! Goulashes are tricky things full of unexpected secrets and our apparent culinary command might turn out to be an over-optimistic impression. Thus, for one thing, the retrieval of insect remains in the pot should never be dismissed right away on the ground of potential intrusions for a large body of evidence, both bibliographical and ethnographical, testifies to entomophagy as a pervasive pattern in the past (e.g. Sutton 1988). Still, arthropods happen to be a particular rich source of data for palaeoenvironmental studies and, notwithstanding exceptions like ostracodes and cladocera, most of the work done concentrated on insects and mites (Carbonel *et al.* 1988; Buckland & Coope 1991; Schelvis 1992a; Polcyn 1996).

From the standpoint of archaeological research, whether one talks about food, environment or diseases the key issue in arthropods is that of bioindication. By this we identify the capacity of an organism to respond to specific environmental parameters (i.e. vegetation, humidity, temperature, presence of an adequate host, etc.) with such regularity that one can infer the later through the presence of the former (Morales 1996). Determining the bioindicator quality of a particular group or species rests upon the notion of modern analogues as defined by Baird (1989).

The work carried out by Schelvis is particularly illustrative of this state of affairs (Schelvis 1992a, b, c, 1994). This author set about to detect and identify dung deposits (certainly not the kind of materials people like to get involved with, yet an excellent source of information about a whole range of problems from sanitary conditions to palaeoenviron-

Fig. 7. - *Filling the pots: the aim of environmental archaeology (reconstruction of the interior of a rather poor late medieval house at Ypres, courtesy IAP).*

mental reconstructions!) from archaeological sites. For such a task, he focused on a particular type of mites (Gamasina) fond of preying upon coprophilous (i.e. excrement-loving) arthropods (Mahmood & Al-Dumaimi 1988). He then had to collect different kinds of manure in order to determine the degree of association of particular species with specific types of excreta (such information, which involves drudging through places like heaps, dunghills, pigsties and cesspits, had never been systematically recorded). Eventually, Schelvis was able not only to gather data to identify the presence of concentrated or diluted dung deposits on archaeological sediments but also to come up with a list of what he calls 'producer-indicating' taxa of the main domesticates' excreta (Table 3).

The potential which these analyses hold for EA is impressive for, among other things, they allow for the detection of particular domestic animal in the absence of its direct remains. This is, obviously, a great leap forward in the whole inference process since animals might represent a vital link in the economy without any need of being slaughtered, butchered or consumed, and Schelvis' works, carried out in a systematic way on Dutch medieval sites, testify to this (Schelvis 1992c). At the 14th-century site of Martinikerkhof (Groningen), for example, Schelvis was able to infer the presence of horses and the use of the place as a stable on the basis of two horse-dung specific gamasids (i.e. *Nenteria stammeri* and *Uroobovella difoveolata*), amounting to 57 % of all mites retrieved in the samples (Fig. 6). This information was later supported by historical evidence for the contemporary building next to the site was found to belong to the Prefect of the Bishop of Utrecht, a man who probably owned horses (Schoneveld 1989).

In retrospect, Schelvis' work once again exemplifies the need to pursue apparently secondary, even trivial, issues in order to come up with coherent pictures of the whole. At the same time, it stresses the fact that, by gathering data about the natural world which often fall outside the aims of the natural scientists themselves, environmental archaeologists are able to provide the interpretative framework needed to contextualize the remains they retrieve. Medieval goulashes are no easy task for non-specialists!

Conclusions

Our quest about goulashes by no means ends at the previous level of analysis. With the aid of explorative physico-chemical techniques it would be quite feasible to track down, for example, the kinds of meat

that the pot used to contain by analysing lipids or proteins left in the pores of the clay matrix (Evershed & Tuross 1996). Or one could find out, through stable isotope analysis of the bones, the kinds of foodstuffs which the boiled pig itself used to feed upon (DeNiro & Epstein 1978). Perhaps we could even elucidate whether the pig was similar to some present-day local breed, in which case a palaeo-DNA analysis (more specifically, a mitochondrial DNA test) could be carried out (Monnerot *et al.* 1994). In short, a whole universe of techniques which can be put to use once the adequate questions have been stated. Few other disciplines within archaeology offer such a wide panoply of possibilities as EA does.

Still, if this quest is to be successful, we need to be reminded, as was stated at the beginning of this paper, that interesting questions normally require the effort of several specialists for they incorporate many co-lateral issues and chances are that none of them can be adequately tackled by one isolated researcher. Some time ago, we made a plea to consider archaeozoology a discipline within the historical sciences (Morales 1993). Most of the reasons given in that paper, meant for Spanish historians, can be extrapolated to the ever arbitrary (see Thomas 1989) division which we maintain between CA and EA to this day [i.e. 'filling the pots (and contextualizing them!) is a cooperative quest']. For this reason, it would be nice to end this contribution with a concise, clearly formulated, conclusion which, to make it as dramatic as possible in the context of our chosen scientific principle, could run as follows: 'Together we stand, divided we fall!'.

Acknowledgements

I would not have written this paper had it not been for the authors which generously provided me with their materials: Allan Hall and Harry Kenward (York), Jaap Schelvis (Groningen), Leonor Peña-Chocarro and my sister Lola Carmen (Madrid). But the man who should have co-signed this paper with me for all his ideas, support, enthusiasm, and, above all, patience is Anton Ervynck, who should be thanked in a very special way. Part of the research work reported in this paper have been financed by grants received by myself from the DGICYT (Spanish National Science Foundation) in particular PBs nº 90-200 and 94-0186

References

BAIRD R.F. 1989: Fossil bird assemblages from australian caves: precise indicators of late Quaternary environments?, *Palaeogeography, Palaeoclimatology, Palaeoecology* 69, 241-244.

BIANCHI G. 1984: *Guide des Ressources halieutiques de l'Atlantique Marocain*, F.A.O., Roma.

BUCKLAND P. & COOPE G.R. 1991: *A Bibliography and Literature Review of Quaternary Entomology*, J.R. Collins Publications, Department of Archaeology and Prehistory, University of Sheffield, Sheffield.

CARBONEL P., COLIN J.P., DANIELOPOL D.L., LÖFFLER H. & NEUSTRUEVA I. 1988: Palaeoecology of limnic ostracodes: a review of some major topics, *Palaeogeography, Palaeoclimatology, Palaeoecology* 62, 413-461.

DE NIRO M.J. & EPSTEIN S. 1978: Influence of diet on the distribution of carbon isotopes in animals, *Geochim., Cosmochim. Acta* 45, 495-506.

DÍAZ A. 1978/79: Un tratado nazarí sobre alimentación, *Cuadernos de Estudios Medievales* VI-VII, 5-37.

ELEXPURU I. 1994: *La cocina de Al-Andalus*, Alianza Editorial, Madrid.

EVERSHED R.P. & TUROSS N. 1996: Proteinaceous Material from Potsherds and Associated Soils, *Journal of Archaeological Science* 23, 429-436.

FERNÁNDEZ GALIANO D. 1975: Excavaciones en la necrópolis hispano-visigoda del Camino de los Afligidos, *Noticiario Arqueológico Hispánico* 4, 5-90.

FRUCTUOSUS I. 1971: Regulae, in: CAMPOS J. & I. ROCA (eds.), *Santos Padres Españoles*, BAC, Madrid.

GARCÍA E. 1978: *Contribución al estudio de la alimentación en Andalucía Islámica*, Unpublished master's thesis, Universidad de Granada.

GARCÍA L.A. 1989: *Historia de la España Visigoda*, Cátedra, Madrid.

GAUTIER A. 1987: Taphonomic groups: How and Why?, *Archaeozoologia* I (2), 47-52.

HALL A. 1986: The fossil evidence for plants in Mediaeval times, *Biologist* 33 (5), 262-267.

KENWARD H. & HALL A.R. 1995: Biological Evidence from anglo-scandinavian deposits at 16-22 Coppergate, in: *The Archaeology of York*, Vol. 14 nº 7, Council for British Archaeology.

LADERO M.A. 1987: *Historia Universal. Edad Media* (Vol. II), Vicens Vives, Barcelona.

LENTACKER A. 1994: Preliminary analysis of the fish remains from the medieval moorish town of Saltés (Huelva, Spain), *Offa* 51, 284-286.

LUBBOCK J. 1865: *Prehistoric times as illustrated by ancient remains and the manners and customs of modern savages*, Williams and Norgate, London.

MACÍAS S. 1996: *Mértola Islámica*, Publicaçoes do Campo Arqueológico de Mértola, Mértola.

MAHMOOD S.H. & AL-DUMAIMI S.I. 1988: Ecologi-

cal study of new records of Iraqui predatory mites developing in animal manure, *Journal of Biological Sciences Research* 19 (supplement), 865-876.

MALPICA A. 1984: El pescado en el Reino de Granada a fines de la Edad Media: especies y nivel de consumo, in: MENJOT D. (Ed.), *Manger et Boire au Moyen Age*, Vol. II, Publications de la Faculté de lettres et sciences humaines de Nice Nº 27-1ère serie, 103-117.

MARÍN M. & D. WAINES (1994): *La alimentación en las culturas islámicas*, Agencia Española de Cooperación Internacional, Madrid.

MONNEROT M., VIGNE J.D., BIJU-DUVAL C., CASANE D., CALLOU C., HARDY C., MOUGEL F., SORIGUER, R., DENNEBOUY N. & MOUNOLOU J.C. 1994: Rabbit and man: genetic and historic approach, *Genet. Sel. Evol.* 26 (Supplement 1), 167-182.

MORALES MUÑIZ A. 1993: A Plea for Recognition: faunal analysis as a historical discipline, *Arqueología Medieval* 4, 255-265.

MORALES MUÑIZ A. 1996: Algunas indicaciones teóricas en torno a la fauna de espacios agrarios en la prehistoria, *Trabajos de Prehistoria* 53 (2), 5-17.

MORALES MUÑIZ A., ROSELLÓ IZQUIERDO E., LENTACKER A. & MORALES MUÑIZ D.C. 1994: Archaeozoological research in Medieval Iberia: Fishing and Fish Trade on almohad sites, *Trabalhos de Antropologia e Etnologia* 34 (1-2), 453-475.

MORALES MUÑIZ, D.C. 1992: Pig Husbandry in Visigoth Iberia: fact and theory, *Archaeofauna* 1, 147-155.

ORLANDIS J. 1988: *Historia del Reino Visigodo Español*, Rialp, Madrid.

POLCYN I. 1996 for 1993: Application of Cladocera analysis in archaeology, *Circaea* 11 (2), 11-48.

REINHARDT J.H. 1822: *Om mosefundre Elsdyr-Resten fra Bornholm, Sjaelland og Fyn - Oversigt Videnskabelige Selskab Forhening for Aaret 1821-1822*, København.

RENFREW C. & BAHN P. 1991: *Archaeology. Theories, methods and practice*, Thames & Hudson, London.

RIU M., BATTLE C., CABESTANY J., CLARAMUNT S., SALRACH J.M. & SÁNCHEZ M. 1982: *Textos comentados de época medieval*, Teide, Madrid.

ROSELLÓ E. 1989: *Arqueoictiofaunas ibéricas. Aproximación metodológica y bio-cultural*, Publicaciones Universidad Autónoma de Madrid, Madrid.

ROSELLÓ E. 1993: Análisis de los peces recuperados en Mértola, *Arqueología Medieval* 2, 277-283.

ROSELLÓ E. & MORALES A. 1991: Calatrava la Vieja: Primer informe sobre la fauna de vertebrados recuperada en el yacimiento almohade. Tercera parte: Peces, *Boletín de Arqueología Medieval* 5, 113-133.

RUBIERA MATA M.J. 1994: La dieta de Ibn Quzmán. Notas sobre la alimentación andalusí a través de su literatura, in: MARÍN M. & D. WAINES (eds.), *La alimentación en las culturas islámicas*, Agencia Española de Cooperación Internacional, Madrid, 127-136.

RÜTIMEYER L. 1861: *Die Fauna der Pfahlbauten in der Schweiz*, Bahnmaier, Basel.

SCHELVIS J. 1992a: *Mites and Archaeozoology: General Methods and Applications to Dutch Sites*, Ph. D. thesis, University of Groningen.

SCHELVIS J. 1992b: The birds and the bees, *Archaeofauna* 2, 163-167.

SCHELVIS J. 1992c: The identification of archaeological dung deposition on the basis of remains of predatory mites, *Journal Archaeological Science* 19, 677-682.

SCHELVIS J. 1994: Predatory mites (Acari; Gamasida) in excrements of five domestic animal species, *Pedobiología* 38, 72-80.

SCHONEVELD J. 1989: De tweede fase van de opgraving Martinikerkhof Groningen (Gr.), *Paleo-aktueel* 1, 98-102.

SUTTON M.Q. 1988: Insects as food: Aboriginal entomography in the Great Basin, *Ballena Press Anthropological Papers* 33, Ballena Press, Menlo Park.

STEENSTRUP J. 1841: *Geonostik-geologisk Undersögelse af Skamoserne Vidnesdam - og Lillemose i det nordligen Sjaelland, ledsaget af sammenlignende Bemaerkninger, hentede fra Danmarks Skov - Kjaer - og Lyngmaser Ialmindelighed*, Munksgaard, København

THOMAS K.D. 1989: What's in a name? Anyone can be an environmental archaeologist, *Circaea* 7 (2), 72-76.

Arturo Morales Muñiz
Laboratorio Arqueozoología - Dpto. Biología
Universidad Autónoma de Madrid
28049 Madrid
España

Umberto Albarella

Size, power, wool and veal: zooarchaeological evidence for late medieval innovations

Introduction

The late Middle Ages was a period of changes in England. The decline of the population and the desertion of vast areas of the countryside caused by the Black Death of the 14th century brought about a slow transformation of society and its economy. Farming and pastoral activities were much affected and gradual modifications in the cultivation of the land and the use of animals eventually led to that set of changes in agrarian practices usually called the "agricultural revolution" (*sensu* Kerridge 1967). These phenomena have for a long time been studied by social and agricultural historians but archaeology has also made a contribution. "The archaeologists have accumulated a mass of information, almost embarrassing in its sheer quantity, for the physical conditions of the past..." (Dyer 1989a, 3), but unfortunately this large bank of data is not easily accessible, hidden in large numbers of "site reports" and even more often never published. Data concerning agricultural life are mainly discussed in sections or appendices on human bones, animal bones and plant remains, which may be difficult to read for the non-specialist, and are often poorly integrated in the general interpretation of a site, let alone a wider geographic area. Fortunately a few syntheses have been made (see for instance Grant 1988 and Greig 1988), but there is still much to be done.

This paper aims to be a contribution in that direction. During the last ten years new archaeological evidence about changes in the use of animals in late medieval and early modern times has come to light. This evidence seems to confirm and complement what historians have been saying and it is, in this respect, most important. We have now direct archaeological indication that, probably since the 15th century and maybe earlier, the emphasis in the kind of use of the main domestic animals was in a process of transformation. The aim of this paper is to review our evidence for these innovations and to see how they contributed towards the creation of a new system of animal exploitation. Here I shall rely upon the information provided by a number of zooarchaeological studies carried out in different parts of England, but also on original work on the animal bones from three important medieval and post-medieval sites, which I have studied – with colleagues – during the last four years. The three main sites discussed here are conveniently situated in different parts of the country, and in particular in the west country (Launceston Castle: Albarella & Davis 1996), in central England (West Cotton: Albarella & Davis 1994 and forthcoming) and in East Anglia (Norwich, Castle Mall: Albarella *et al.* forthcoming) (Fig. 1).

Any overview runs the risk of oversimplifying the evidence. We are dealing with complex phenomena, which are subject to much chronological and regional variation, and are influenced by a large number of variables related to differences in society, the environment, the cultural context and so on. In my attempt at identifying general trends some of this variability and complexity will be left unmentioned. This does not mean that I am not aware of the fact that, for instance, what happened in the south of the country cannot be entirely applied to the north or that changes in marginal areas did not occur at the same pace as in more central regions. However, I also believe that only by trying to pose general questions, and when possible providing answers to them, can we reconstruct the way medieval people brought about the creation of modern farming.

Size increase

The most remarkable evidence of a change in the type of animals – and consequently in their use – between medieval and early modern times comes from bone measurements. Cattle, sheep and to some extent pig, domestic fowl and possibly horse all increased in size, and recent archaeological evidence suggests that the beginning of this trend is to be found already in the 16th century, and possibly earlier. This important phenomenon is reviewed elsewhere (Alba-

Fig. 1. - *Location of the main sites discussed in the text.*

rella & Davis 1996; Davis in press), and it will only be briefly discussed here.

Modern breeds have larger bones than most animals found in archaeological sites. It is also known that specimens found in 19th, 18th and to some extent 17th century levels tend to be larger than medieval animals, though in most cases not as large as recent "improved" breeds. We have known this from archaeological and historical evidence for a long time, but recent archaeological work has thrown further light on the problem. The main findings of this more recent research can be summarised as follows:
a. in medieval times different sizes of cattle and sheep could be found in different regions of England. It seems that animals from peripheral areas, such as the west country and the far North, were smaller

(Albarella & Davis 1994). The small size of Welsh and Cornish livestock is also mentioned in historical sources (Thirsk 1967)

b. the increase in size started, at least in some areas and for some species, earlier than was thought in the past. At Launceston Castle we have evidence of a substantial size increase already in the 16th century, and, although much smaller, in the 15th century (Fig. 2). Very large 16th century animals have also been found at Lincoln (Dobney *et al.* 1996) and Camber Castle, Sussex (Connell & Davis in prep.). The presence of "improved" sheep in 16th century Cornwall is also mentioned by Carew (1602)

c. the size increase did not occur at the same pace and at the same time for all species. In cattle it was rather sudden, whereas in sheep much more gradual (Fig. 2). In pig and domestic fowl it occurred at a later stage, perhaps no earlier than the 17th century.

How and why did this increase occur? The first question is far from easy to answer, but it is probably safe enough to say that it resulted from a combination of local improvement and introduction of different, larger breeds from the continent. The relative importance of these two components probably varied in different regions, but undoubtedly both played a role. The importation of large, "long legged" Dutch cattle in the 16th century is attested by historical sources (Trow-Smith 1957, 203), but surely other kinds of overseas livestock contributed to the improvement of local breeds, perhaps in a way similar to what had happened during the Roman conquest. An improved level of nutrition can also cause an increase in body size, not necessarily connected to a genetic change. However, our evidence from Launceston Castle and Castle Mall indicates that not only bones but also teeth became larger. Teeth are much more conservative in their structure and less susceptible than bones to environmental changes (Degerbøl 1963; Payne & Bull 1988). It is therefore likely that an increase in tooth size is related to the presence of a genetically different type of livestock.

An answer to the question "why" can be provided only once the other innovations have been discussed. It is quite obvious that larger animals provide more meat, but more important than the absolute body size of the adult animal is the speed of the development after birth. The archaeological evidence suggests that this could be obtained through the creation of faster growing animals, in many respects similar to the modern breeds. But to understand this phenomenon more fully we have to turn our attention to the changes which occurred in the kill-off patterns of the main livestock.

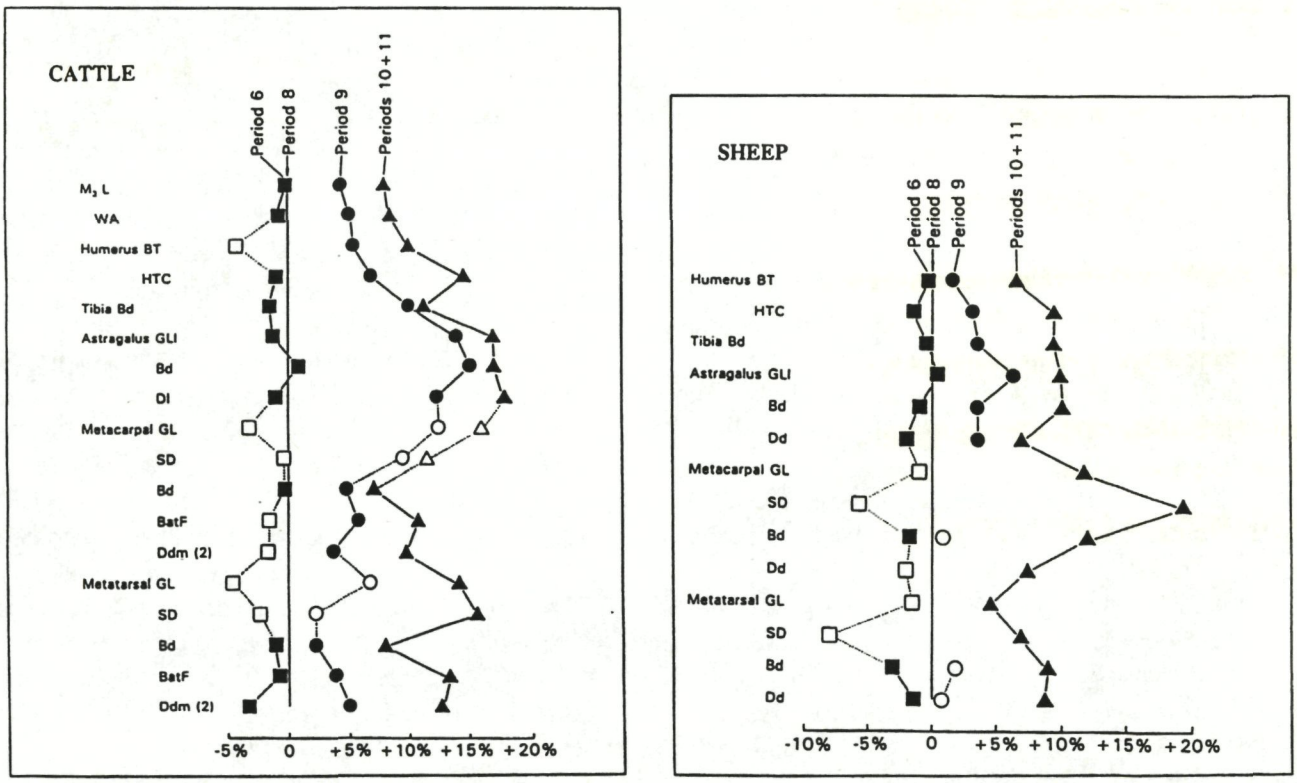

Fig. 2. - *Size increase in cattle and sheep at Launceston Castle (from Albarella & Davies 1996). Percentage differences from period 8 for selected measurements. Samples where n<10 are shown as open symbols. For a definition of the measurements see von den Driesch (1976) and Davies (1992).*
Period 6 = late 13th c., Period 8 = 15th c., Period 9 = 16th-early 17th c., Period 10 + 11 = late 17th-early 19th c.

Veal

Most cattle bones found in early medieval contexts from English sites belong to fully mature animals. However, in 15th-16th century and later contexts large numbers of bones and mandibles of calves are found alongside adult specimens (Grant 1988). This evidence is particularly striking at Norwich, where in contexts pre-dating the 15th century there are only mature animals, but there are plenty of juvenile specimens in later phases (Jones 1994; Moreno Garcia forthcoming; Albarella *et al.* forthcoming) (Fig. 3). At the Norwich site of St.Martin-at-Palace Plain, calf bones are found in contexts dated as early as the 14th-15th century (Cartledge 1987), which suggests that this change in the kill-off pattern might have occurred even earlier in Norwich than in other parts of the country. Further evidence for a change in the cattle mortality curve comes from other sites across England such as Exeter (Maltby 1979), Sandal Castle (Griffith *et al.* 1983), Leicester St.Peter's Lane (Gidney 1991b and 1991c), St.Andrew's Priory (O'Connor 1993), Launceston Castle and Lincoln (Dobney *et al.* 1996).

This new culling strategy for cattle may be associated with a major change in their use. During most of the Middle Ages cattle had mainly been exploited for their traction power, but with the increasing use of horses for ploughing and other agricultural activities, there was a change in the use of cattle, which, by post-medieval times, had, in many areas, mainly become a source of meat and milk (Trow-Smith 1957; Langdon 1986; Dyer 1991). The fattening and culling of young calves would have gone hand in hand with the production of high quality veal – very much sought after by townspeople (Thirsk 1967) – and the exploitation of cow milk for human consumption. Beef production also increased in importance and in some sites we have indeed a lower percentage of elderly animals in the later phases, but in none of these sites the difference is striking.

The relative importance of meat and dairy products varied in different areas: for instance in early modern Norfolk the emphasis was on meat production, whereas in Suffolk the opposite was the case (Overton & Campbell 1992). In some "marginal" areas such as Devon and Cornwall apparently the move away from the use of cattle for traction never occurred (Trow-Smith 1957). If this is indeed true, then the young calves found in 16th century contexts from the Cornish site of Launceston Castle might have been imported from further afield.

Horse power

It is suggested above that the changed kill-off pattern in cattle may be associated to the increasing importance of horses in agriculture. This phenomenon is well known from historical sources and it has been fully discussed by Langdon (1986). Langdon suggests that horses started replacing cattle as the main traction animals as early as the 12th century, but this was a very gradual phenomenon, and it is only in early modern times that the importance of horses reached its peak (see also Overton & Campbell 1992).

The archaeological evidence for these innovations in the use of equids comes from two main lines of evidence: the higher frequency of horses in bone assemblages from late medieval times and their increased size. Many factors contribute to the frequency of species found in faunal assemblages and its interpretation is therefore hardly straightforward. One further complication is that horses are not primarily meat animals and therefore their patterns of disposal tend to be different from those of cattle. For the same reason they are expected to be more frequent on sites where there was low meat consumption and rarer on sites where much meat was eaten. It is interesting in this respect to compare the frequency of horse bones at West Cotton, Launceston Castle and Norwich, Castle Mall (Fig. 4). In all sites there is a steady increase in horse frequency with time, but probably only at West Cotton – a rural site – can this be attributed to an actual change in the relative importance of different animals: our assumption was that in the late medieval period horses had started replacing cattle as the main traction animals (Albarella & Davis 1994). At Launceston Castle the higher number of horses in post-medieval times might merely be attributed to the fact that the site changed its status, and by the 16th century it was hardly used by the aristocracy. A lower status probably implies a lower consumption of meat and a higher frequency of non-meat animals – alongside horses dogs also become more common in the 16th century and later. At Castle Mall the very marked occurrence of horses in the latest phase is probably merely attributable to a change in disposal practices. Complications therefore exist and caution is necessary in interpreting the relative frequency of different species. Nevertheless, a general trend towards increase in horse frequency seems to be an actual feature of some late medieval sites.

The use of horses for ploughing probably encouraged the selection of larger and stronger animals. By the 14th century in France and England a large horse, defined as "*magnus equus*", seems to be present, which suggests that some increase in size was taking

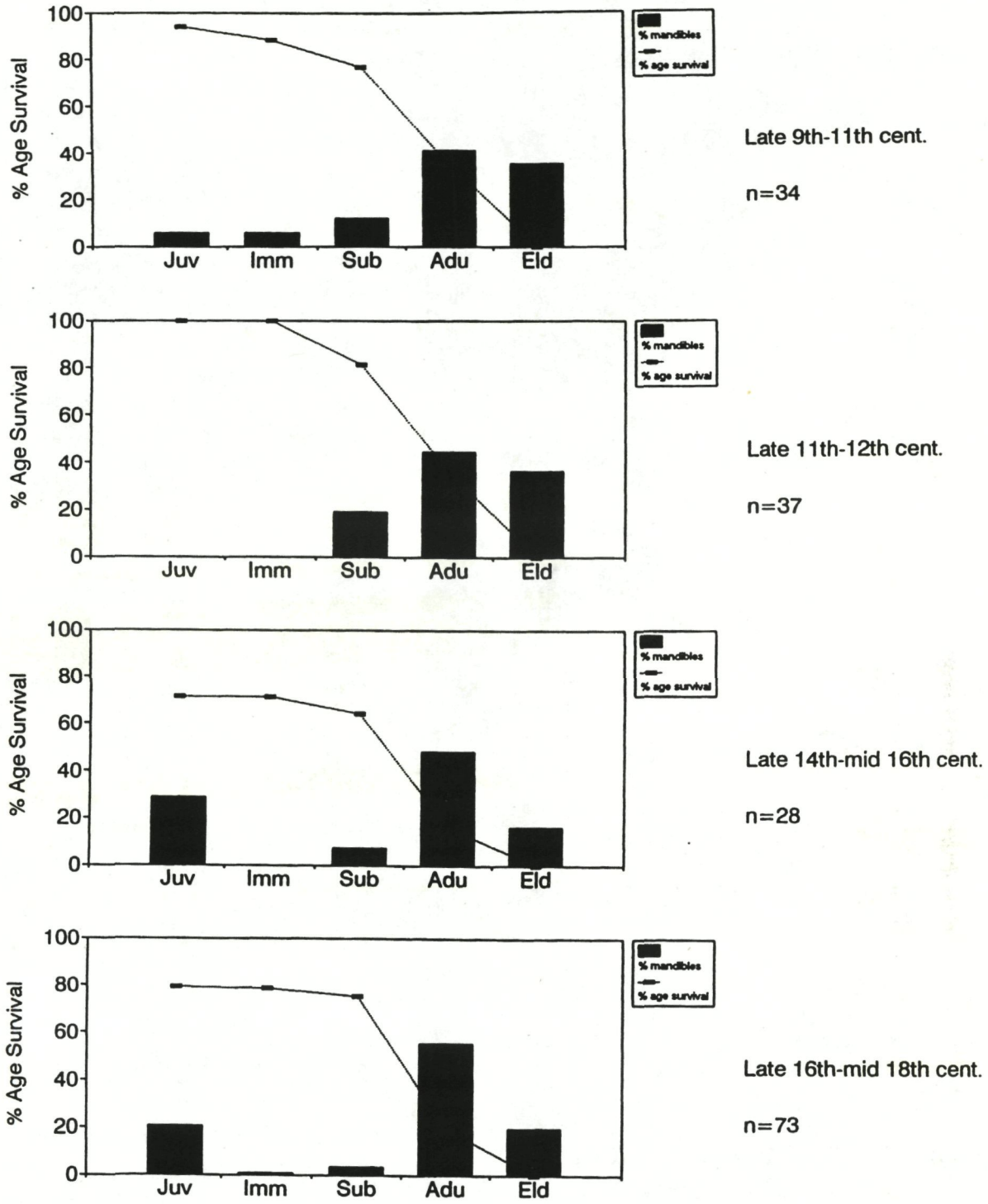

Fig. 3. - *Relative percentages of Cattle mandibles by age stage in different periods at Norwich, Castle Mall (from Albarella, Beech & Mulville forthcoming). Age stages are from O'Connor (1988).* Juv = juvenile, Imm = immature, Sub = subadult, Adu = adult, Eld = elderly.

place (Langdon 1986). However, the archaeological evidence indicates that late medieval and 16th century horses were probably barely larger than a pony (the maximum height for a pony is 14 hands and 2 inches), yet somewhat larger than their Anglo-Saxon and early medieval predecessors (see Dobney *et al.*1996 and Albarella *et al.* forthcoming). This suggests that horse breeders had made some progress towards the production of larger breeds.

Wool

It is hard to find a product more important than wool in the English medieval economy (Farmer 1991). By the beginning of the 13th century English wool was considered the best in Europe (Grand & Delatouche 1950) and it was exported in large quantities, either as raw material or as cloth. The wool trade probably reached its peak in the late 13th –

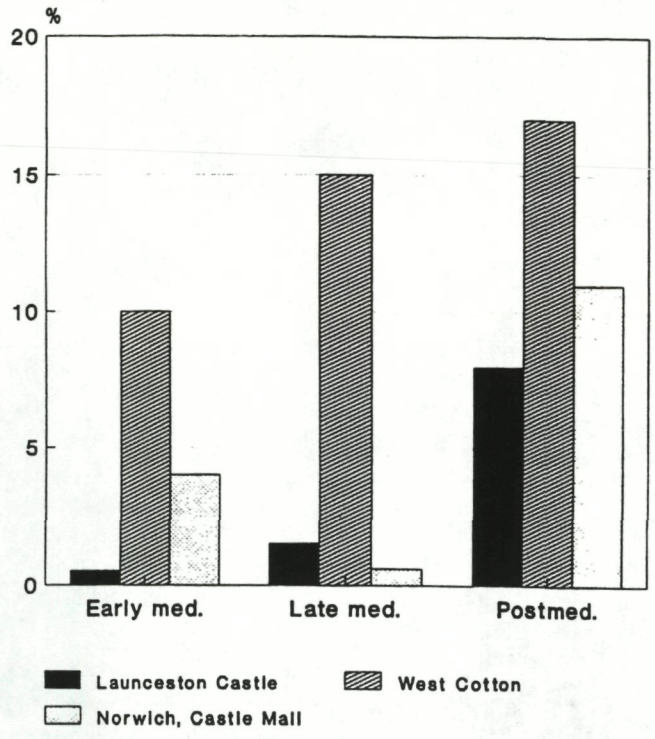

Fig. 4. - *Frequency of horse bones at Launceston, West Cotton and Castle Mall.*

early 14th century (Dyer 1988 and pers. comm.), and did not decrease in importance in later times, despite the pressure to produce more mutton (Trow-Smith 1957). In this respect the destiny of sheep exploitation was different from that of cattle, for which one main function – meat production – ended up replacing the previous one – traction power.

The ever increasing importance of sheep is not only attested by historical sources, but by also substantial archaeological evidence. In many archaeological sites the frequencies of sheep remains increase in later medieval and post-medieval times, mainly at the expense of pig (Grant 1988; Overton & Campbell 1992; Albarella & Davis 1994; Albarella *et al.* forthcoming). This increase probably reflects the rise of the wool trade. This assumption is reinforced by the study of kill-off patterns. A trend towards culling of older animals in late medieval and post-medieval periods has been found on many sites in different areas of England, such as Leicester St.Peter's Lane (Gidney 1991b and 1991c), Leicester, Little Lane (Gidney 1991a and 1992), Colchester (Luff 1993), West Cotton (Fig. 5), Launceston Castle, Lincoln (Dobney *et al.* 1996) and Norwich, Castle Mall. Although a few exceptions can be found – for instance at Exeter a large number of lambs were recovered in the post-medieval levels (Maltby 1979) – these findings suggest that wool production continued to be important in the 16th and 17th centuries.

Without doubt wool was important in Saxon and early Medieval times too, but then the main emphasis was on meat and possibly milk production. It is likely that the same flock was used for more than one purpose, with animals killed sufficiently young to provide good quality mutton. In later times sheep were only slaughtered after two or more fleeces had been taken. But even then mutton still had some importance. This is suggested by the fact that quite often the mortality peak is at about four years. Indeed Muffet (1655) advises that good mutton does not have to be older than four years. If the late medieval economy had been highly specialized in wool production we would expect an even older age for these animals. In fact a highly specialized husbandry is a contemporary phenomenon. In the past farmers tended to use animals for many purposes, though there could be an emphasis on one or two products.

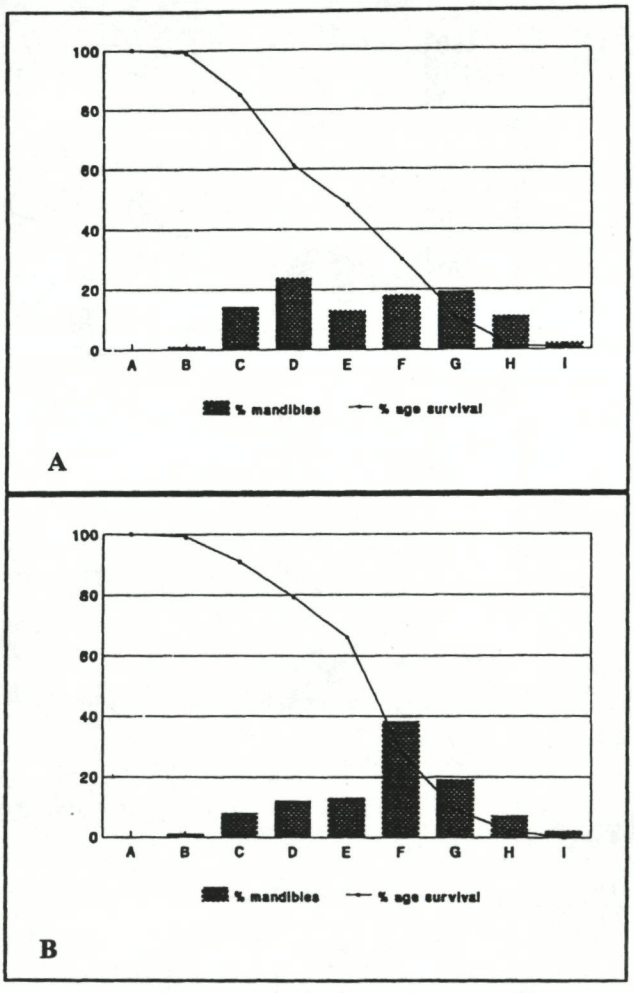

Fig. 5. - *Relative percentages of Sheep mandibles by age stage in different periods at West Cotton (from Albarella & Davies 1994). Age stages are from Pyne (1973).*
A. West Cotton, Early Medieval, n=99.
B. West Cotton, Mid-Late Medieval, n=99.

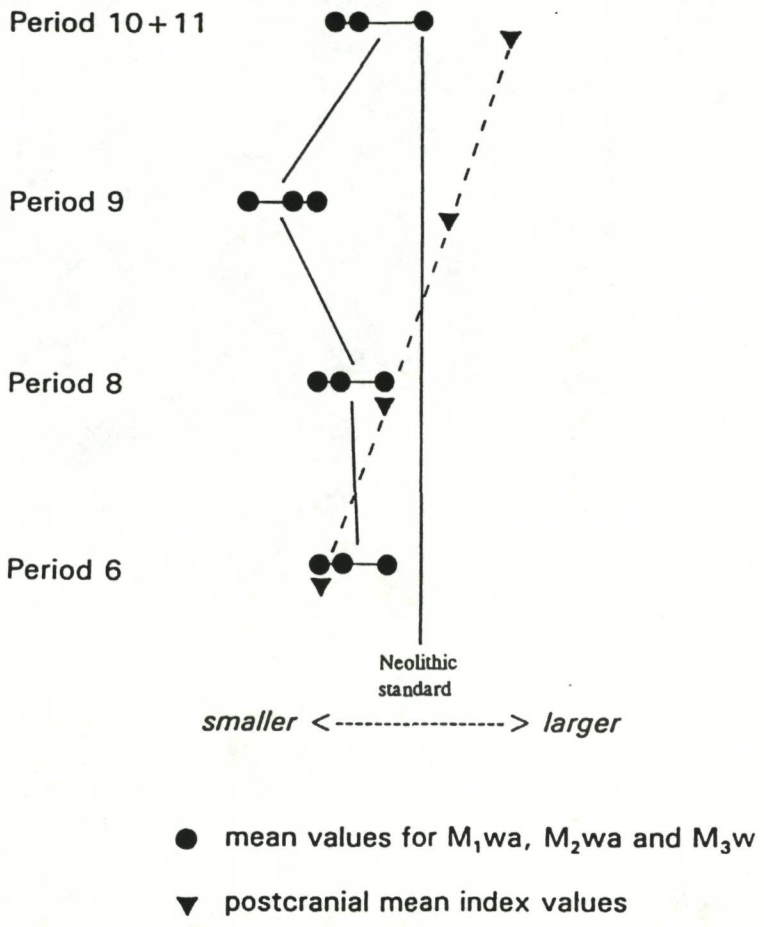

Fig. 6. - *Size changes in Pig teeth and postcranial bones from Launceston Castle (from Albarella & Davies 1996) using a log ratio for comparison with a standard Neolithic pig sample from Durrington Walls, Witshire, England (Albarella & Payne in prep.). M wa, M wa and M w are the anterior widths of the first, second and third lower molars, as defined by Payne & Bull (1988). See Fig. 2 for the chronology of the periods.*

The size increase in sheep which starts being archaeologically recordable at least since the 16th century (see above) represents evidence of a concern in the "creation" of animals with a larger body mass and which would therefore produce more meat. Wool and meat production were going in parallel directions and the aim of the late medieval/early modern agriculturalists was probably to "create" animals which could efficiently provide both products.

Fast growing pigs

Unlike cattle and sheep no major changes in the size or age at death of pigs seem to have occurred within the Middle Ages. However, the evidence is still rather sparse. The study of size variation in pig has been handicapped by the fact that most postcranial bones of pigs from archaeological sites are juvenile (i.e. the epiphyses are unfused) and therefore not useful for determining size. Moreover, measurements of pig teeth have only occasionally been taken by zooarchaeologists, at least until Payne and Bull's (1988) publication which emphasized the importance of dental measurements.

We cannot therefore exclude the possibility that changes in pig size might be detected in future. In the meantime, we have evidence that pig breeds and pig husbandry had been subject to some change at least by the 17th century. Data from Launceston Castle, Castle Mall and Lincoln (Dobney *et al.* 1996) all indicate that in post-medieval times new types (breeds?) of pigs were present in England. Compared to the medieval animals these had much larger bones and only slightly larger teeth. Interestingly, the 16th century animals from Launceston Castle had slightly larger bones, but smaller teeth than their medieval ancestors (Fig. 6), possible evidence for the presence of yet another type of pig, different from both the medieval and the 17th century animals.

Pigs are generally killed at a younger age than most cattle and sheep, as they are exploited almost entirely for meat and fat. However, we have archaeological evidence from Exeter (Maltby 1979), Lincoln (Dobney *et al.* 1996) and Castle Mall that pigs were being culled at an even earlier age in post-medieval times, with most animals slaughtered when approximately one year old. In fact, this is the age when the culling of pigs was recommended by early modern agriculturalists (Markham 1614; Mortimer 1707). At Launceston Castle such a change in the kill-off pattern did not occur, and this is consistent with what we know from historical sources about a rather late culling strategy in the west country (see Marshall 1796).

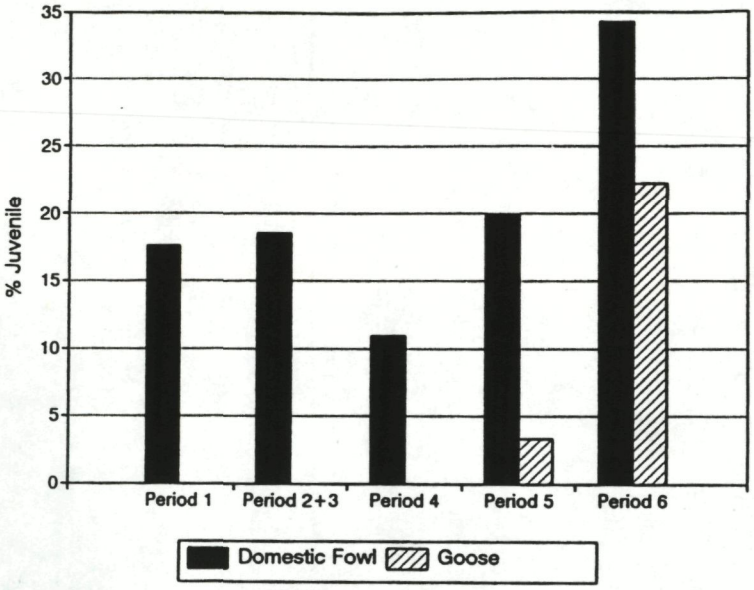

Fig. 7. - *Relative percentage of juvenile domestic fowl and goose at Norwich, Castlle Mall (from Albarella et al. Fothcoming).*
Period 1 = late 9th-11th; Period 2 + 3 = late 11th-12th; Period 4 = late 12th-mid 14th; Period 5 = late 14th-mid 16th; Period 6 = late 16th-mid 18th.

		Period 1	Period 2 + 3	Period 4	Period 5	Period 6
Sample sizes (Total NISP)	Domestic Fowl	245	151	146	176	111
	Goose	25	32	29	60	27

The changes in size and mortality are obviously connected. The culling of younger beasts became possible only because of their size increase. Indeed it is inconvenient to kill animals when they are too young, because this is an inefficient use of their body mass. But if the animals are fast growing and thus reach their full weight early, the age of their slaughtering can be brought forward. This was probably the main improvement in pig husbandry in post-medieval times.

The fact that post-medieval pigs had bones relatively larger than teeth can also be, at least in part, attributed to a higher level of nutrition. But the fact that teeth, although to a much lesser extent, also increased in size, suggests the existence of a genuine genetic difference between medieval and post-medieval animals. The importation of new breeds in the 18th century (Epstein & Bichard 1984) surely at least in part contributed to the creation of the modern types.

The decline of the goat

In medieval times goats were probably bred mainly for milk. The production of kid meat – which was considered a great delicacy (Wilson 1973) – was probably a by-product of dairying. The meat of the adult goat was never highly regarded in England (Markham 1614; Burke 1834) and it was thus probably consumed by goat breeders themselves and only occasionally sold in the market. Moreover, goats are animals of warm climates and rocky environments and have never been very successful in northern Europe. Because of their "browsing" habits they are also destructive animals and consequently they had to be kept clear of woods (Fussell 1936; Dyer 1991 and pers. comm.) and possibly confined in mountainous areas (Thirsk 1967). Burke (1834) suggests that the situation got worse when land was enclosed – one of the main innovations of the "agricultural revolution" (Kerridge 1967) – because goats tended to destroy hedgerows; as a consequence they were "banished ...from the soil" (Burke 1834). However, the situation probably varied in different areas. In localities in the West Midlands for instance goat breeding was discouraged in the 13th century, but "when the pressure on resources relaxed" in the following two centuries – mainly due to the human demographic decline – quite large numbers are recorded (Dyer 1991).

In most English sites, including Exeter (Maltby 1979), North Elmham (Noddle 1980), Colchester (Luff 1993), Launceston Castle and Castle Mall, by post-medieval times there is a sharp decline in the number of goat bones . Due to the wide distribution of these sites this is likely to be a countrywide phenomenon. It is possible that, as Burke (1834) suggested, the enclosure of land played an important role in the decline of goat in England. Another possible explanation is that the function of the goat as a milk producer had lost its importance, due to the greater emphasis being put on cattle dairying.

Domestic birds

The main domestic mammals provided most of the meat and other animal products, but the importance of birds in the medieval economy should not be ignored. Domestic fowl and goose in particular were important sources of meat, eggs and, in the case of the goose, feathers too (Grand & Delatouche 1950). It is difficult to assess whether the importance of domestic birds relative to mammals was subject to any kind of change in late medieval and post-medieval times. Bird bones are generally much smaller than mammal ones, and are therefore subject to different patterns of recovery and preservation. Differences in the frequencies of mammals and birds often merely reflect recovery and preservation biases rather then genuine economic differences. Another problem is the dearth of bird bone assemblages from post-medieval sites. Large quantities of bird bones are generally collected only from sieved samples, and due to a lack of interest that is sometimes paid to relatively recent periods, sieving on post-medieval sites is only rarely undertaken.

Notwithstanding problems of recovery, some interesting information about changes in the use of birds could be detected from our study of the Castle Mall animal bones. In the case of domestic fowl, in the 15th-16th century and later we found a higher number of males and juveniles than in early medieval times (Albarella *et al.* forthcoming, but see also data in Moreno Garcia forthcoming) (Fig. 7). A larger size of the chicken bones in the later levels was also noted. This might reflect a change in the use of this species. Whereas in medieval times there was a mixed economy aimed at the production of both meat and eggs, in later times a breeding system more specialized towards meat was probably taking over. The production of good quality meat would imply the killing of young animals and an emphasis in the creation of larger breeds. Moreover there would be no need to keep a high number of adult females – an ideal ratio of about five hens to one cock is recommended for egg production (Columella VII.2.13 and Grand & Delatouche 1950) – hence the higher frequency of adult males at post-medieval Castle Mall. A higher number of young specimens in late medieval levels has also been noted on other English sites (Grant 1988).

Goose breeding was moving approximately in the same direction. No juvenile goose bones were found in any medieval periods at Castle Mall, but several were found in levels from the 15th century onwards (Fig. 7), suggesting that, like the chicken, in post-medieval times geese were being kept primarily for their flesh. A similar increase of juvenile geese in later periods has also been noticed at Winchester (Rees & Serjeantson forthcoming).

A new economic system

We have seen that important changes occurred in the type and use of domestic animals between the 15th and the 17th century in England. The time span of these innovations is so wide that we can hardly regard them as a "revolution". However gradual these phenomena could have been, it is clear that by the beginning of the modern era a new economic system of animal husbandry was under way. The main changes have been discussed above and are summarised in the following table (the animal products or uses of greater importance have been indicated in capital letters) (see table below):

Hides, skins, wool fells, bones and horns were also intensively used, but probably they could never be regarded as anything more than important by-products. These changes only represent broad trends and they are not necessarily true for all parts of the country. Local exceptions certainly occurred. The trend regarding domestic birds in particular is here presented in a rather tentative way: many more data from post-medieval sites are needed.

The changes were not all simultaneous. We have seen for instance that the replacement of oxen by horses for ploughing may have occurred in some

	medieval	late medieval - post-medieval
Cattle	TRACTION, meat, milk	MEAT, milk (traction in limited areas)
Sheep	WOOL, meat, milk	WOOL, MEAT, milk
Pig	MEAT, fat	MEAT, fat
Goat	milk, meat	-
Horse	traction	TRACTION
Domestic fowl	EGGS, meat	MEAT, eggs
Goose	FEATHERS, eggs, meat	MEAT, feathers, eggs

areas more quickly than in others. In general it seems that variation in kill-off patterns preceded size and morphological changes: young calf bones can already be found in 15th century contexts, whereas the main size increase probably did not occur until the following century. It is plausible to assume that a new type of cattle use, more specifically aimed at the production of meat, was associated with a different kill-off pattern and led to the selection of larger beasts. In the case of the sheep the variations in age and size may not be associated. The selection of older animals was mainly aimed at the production of more wool, whereas the somewhat later phenomenon of size increase was mainly caused by the concern to produce more meat.

Economic systems are complex and they comprise a series of interacting variables. Therefore it is not surprising that one change in the system caused the need to adjust the other elements in order to find a new equilibrium. A change in the use of one animal species necessarily led to a modification in the husbandry of the rest of the livestock. For instance when cattle started being slaughtered at a younger age to provide more meat, the traction power that this animal used to provide had to be replaced in some way. Hence the increasing importance of horses in the later Middle Ages.

However, economic systems are never isolated, and if changes occurred, we must wonder what was the external force behind them. To try to solve this problem it is necessary to bear in mind that, as well as the economy, late medieval human society was in a state of instability and many changes were taking place (Dyer 1989a). The pestilence of the 14th century caused a dramatic drop of the English population (Hatcher 1977) and as a consequence the following century was characterized by a such a reduced pressure on resources and on the countryside (Dyer 1989b), that Postan (1972) writes of a "decolonization" of the land. The 16th century saw a new demographic increase (Wrigley & Schofield 1981) and as a consequence a renewed intensification in the use of natural resources. The later Middle Ages had also seen a shift from a more agrarian to a more pastoral oriented economy (Harvey 1991), to the extent that livestock density in eastern England almost doubled (Campbell & Overton 1992).

Looking back at the above table it is possible to see that a general consequence of the late medieval changes was a greater emphasis on meat production. All animals which could provide a reasonable amount of meat were by post-medieval times mainly reared for this purpose, with the only exception of the sheep for which wool was an equally important product. If we also take into account the higher density of livestock in this period, the sheer quantity of meat that was possible to produce in the 15th-16th century must have been far greater than in early medieval times. The demand for more meat by the growing population was also associated with changes in consumption patterns generated by a "degree of material improvement for many sections of urban society" (Dyer 1989a, 210). It is likely that the individual rate of meat consumption increased after the Middle Ages, although this was not a continuous trend and fluctuations occurred – for instance as a consequence of the fall in value of wages in the second half of the 16th century (Chris Dyer pers. comm.). However, the demand for meat supply – in particular from the towns – must have been – by post-medieval times – quite remarkable.

A more intensive pastoral production was already on its way in the 15th century, and it might have been one of the key factors which encouraged the subsequent demographic growth. At some point the two phenomena – population growth and higher farming productivity – probably started reinforcing each other. More recently the beginning of the mechanization in agriculture and the development of intensive stock rearing gave a further boost to the demographic increase, though unfortunately this has been at the expense of animal welfare.

In conclusions, our archaeological evidence supports and complements the findings of historians such as Kerridge (1967), Langdon (1986) and Dyer (1989a) that a new system of animal exploitation was on its way by the end of medieval times. A system which permitted a more efficient use of resources, a higher output of meat and ultimately supported the growth of the English population.

Acknowledgements

I would like to thank Simon Davis, Chris Dyer and Dale Serjeantson for comments on an earlier draft and for much useful discussion on many questions raised in this paper.

References

ALBARELLA U., BEECH M. & MULVILLE J. (forthcoming): *The Saxon, medieval and post-medieval mammal and bird bones excavated 1989-1991 from Castle Mall, Norwich (Norfolk)*, London, AML report 00/97.

ALBARELLA U. & DAVIS S. 1994: *The Saxon and Medieval animal bones excavated 1985-1989 from West Cotton, Northamptonshire*, London, AML report 17/94.

ALBARELLA U. & DAVIS S. 1996: Mammals and bird bones from Launceston Castle: decline in status and the rise of agriculture, *Circaea* 12 (1) 1996 for 1994, 1-156.

ALBARELLA U. & DAVIS S. forthcoming: The animal bones, in: CHAPMAN A. (ed.), *West Cotton: a study of a medieval settlement dynamics.*

BURKE J. 1834: *British husbandry; exhibiting the farming practice in various parts of the United Kingdom*, 2 vols, London, Baldwin and Cradock.

CAREW R. 1602: *The Survey of Cornwall*, London, Iohn Iaggard.

CARTLEDGE J. 1987: Mammal Bones, in: AYERS B., *Excavations at St. Martin-at-Palace Plain, Norwich, 1981*, East Anglian Archaeology 37, 111-113 (and microfiche tables 9-15).

DAVIS S. 1992: *A rapid method for recording information about mammal bones from archaeological sites*, London, AML report 19/92.

DAVIS S. in press: The agricultural revolution in England: some zooarchaeological evidence, *Proceedings of the 7th ICAZ conference, Konstanz.*

DEGERBØL M. 1963: Prehistoric cattle in Denmark and adjacent areas, in: MOURANT A. & ZEUNER F. (eds.), *Man and cattle*, London, Royal Anthropological Institute, 69-79.

DOBNEY K., JAQUES D. & IRVING B. 1996: *Of butchers and breeds. Report on vertebrate remains from various sites in the City of Lincoln*, Lincoln Archaeological Studies 5.

DRIESCH A. VON DEN 1976: *A guide to the measurement of animal bones from archaeological sites*, Peabody Museum Bulletin 1, Cambridge Mass., Harvard University.

DYER C. 1988: Documentary evidence: problem and enquiries, in: ASTILL G. & GRANT A. (eds.), *The countryside of medieval England,* Oxford, Blackwell, 149-261.

DYER C. 1989a: *Standards of living in the later Middle Ages: social change in England c.1200-1520*, Cambridge Medieval Textbooks.

DYER C. 1989b: 'The retreat from marginal land': the growth and decline of medieval rural settlements, in: ASTON M., AUSTIN D. & DYER C. (eds.), *The rural settlements of medieval England*, Oxford, Blackwell, 45-57.

DYER C. 1991: The West Midlands, in: MILLER E. (ed.), *The agrarian history of England and Wales. Volume III 1348-1500*, Cambridge University Press, 222-237.

EPSTEIN H. & BICHARD M. 1984: Pig, in: MASON I. (ed.), *Evolution of domesticated animals*, London and New York, Longman, 145-161.

FARMER D. 1991: Marketing the produce of the countryside, 1200-1500, in: MILLER E. (ed.), *The agrarian history of England and Wales. Volume III 1348-1500*, 324-430, Cambridge University Press.

FUSSELL G. 1936: English Farming before 1815, in: ERNLE LORD, *English farming. Past and present*, London, Melbourne and Toronto, Heinemann, xxi-lxxv.

GIDNEY L. 1991a: *Leicester, the Shires, 1988 excavations: the animal bones from the Medieval deposits at Little Lane*, London, AML report 57/91.

GIDNEY L. 1991b: *Leicester, the Shires, 1988 excavations: the animal bones from the Medieval deposits at St.Peter's Lane*, London, AML report 116/91.

GIDNEY L. 1991c: *The animal bones from the post-medieval deposits at St Peter's Lane*, London, AML report 131/91.

GIDNEY L. 1992: *Leicester, the Shires, 1988 excavations: the animal bones from the post-medieval deposits at Little Lane*, London, AML report 24/92.

GRAND R. & DELATOUCHE R. 1950: *L'agriculture au moyen age, de la fin de l'empire romain au XVI^e siècle*, Paris, Boccard.

GRANT A. 1988: Animal resources, in: ASTILL G. & GRANT A. (eds.), *The countryside of medieval England*, Oxford, Blackwell, 149-261.

GREIG J. 1988: Plant resources, in: ASTILL G. & GRANT A. (eds.), *The countryside of medieval England*, Oxford, Blackwell, 108-127.

GRIFFITH N., HALSTEAD P., MACLEAN A. & ROWLEY-CONWY, P. 1983: Faunal remains and economy, in: MAYES P. & BUTLER L., *Sandal Castle Excavations 1964-1973*, Wakefield Historical Publications, 341-348.

HARVEY P. 1991: The Home Counties, in: MILLER E. (ed.), *The agrarian history of England and Wales. Volume III 1348-1500*, 254-267, Cambridge University Press.

HATCHER J. 1977: *Plague, population and the English economy, 1348-1530*, London, McMillan.

JONES G. 1994: Mammal and Bird Bone, in: AYERS B., *Excavations at Fishergate, Norwich, 1985*, East Anglian Archaeology 68, 37-42.

KERRIDGE E. 1967: *The Agricultural Revolution*, London, Allen and Unwin.

LANGDON J. 1986: *Horses, oxen and technological innovation*, Cambridge University Press.

LUFF R. 1993: *Animal bones from excavations in Colchester, 1971-85*, Colchester Archaeological report 12.

MALTBY M. 1979: *The animal bones from Exeter 1971-1975*, Exeter Archaeological Reports 2.

MARKHAM G. 1614: *Cheape and good husbandry for the well-ordering of all beasts, and fowles, and for the generall cure of their diseases*, London, Roger Jackson.

MARSHALL W. 1796: *The rural economy of the west of England,* London.

MORENO GARCIA M. forthcoming: *Animal bones from the flint shaft, Castle Mall, Norwich.*

MORTIMER J. 1707: *The whole art of husbandry, or, the way of managing and improving of land,* London, Mortlock.

MUFFETT T. 1655: *Health's improvement: or, rules comprizing and discovering the nature, method, and manner of preparing all sorts of food used in this nation,* London, Samuel Thomson.

NODDLE B. 1980: Identification and interpretation of the mammal bones, in: WADE-MARTINS P., *North Elmham Park* Vol. II, East Anglian Archaeology 9, 377-409.

O'CONNOR T. 1988: *Bones from the General Accident Site, Tanner Row,* The Archaeology of York 15/2, London, Council for British Archaeology.

O'CONNOR T. 1993: Bone assemblages from monastic sites: many questions but few data, in: GILCHRIST R. & MYTUM H. (eds.), *Advances in monastic archaeology,* BAR British series 227, Oxford, 107-111.

OVERTON M. & CAMPBELL B. 1992: Norfolk livestock farming 1250-1740: a comparative study of manorial accounts and probate inventories, *Journal of Historical Geography* 18 (4), 377-396.

PAYNE S. 1973: Kill-off patterns in sheep and goats: the mandibles from Asvan Kale, *Anatolian Studies* 23, 281-303.

PAYNE S. & BULL G. 1988: Components of variation in measurements of pig bones and teeth, and the use of measurements to distinguish wild from domestic pig remains, *Archaeozoologia* 2, 27-65.

POSTAN M. 1972: *The medieval economy and society,* London, Weidenfield and Nicolson.

REES H. & SERJEANTSON D. (eds.): *Food, craft and status in Saxon and Medieval Winchester. The plant and animal evidence from the suburbs and city defences,* Winchester Monograph Series 10.

THIRSK J. 1967: Farming techniques, in: THIRSK J. (ed.), *The agrarian history of England and Wales. Volume IV 1500-1640,* Cambridge University Press, 161-199.

TROW-SMITH R. 1957: *A history of British livestock husbandry to 1700,* London, Routledge and Kegan Paul.

WILSON A. 1973: *Food and drink in Britain, from the Stone Age to recent times,* Harmondsworth, Penguin.

WRIGLEY E. & SCHOFIELD R. 1981: *The population history of England, 1541-1871: a reconstruction,* London, Edward Arnold.

Umberto Albarella
Department of Ancient History and Archaeology
University of Birmingham
Edgbaston
Birmingham B15 2TT
England

Fabio Giovannini

L'importanza del bovino nell'europa occidentale medievale: allevamento, forza-lavoro, contributo alimentare

L'arrivo delle popolazioni germaniche nei territori romanzi ebbe senza dubbio un contraccolpo sul sistema di organizzazione rurale tardoantico, basato su un sistema di aziende agricole specializzate nelle coltivazioni cerealicole.

Questa produzione di grano e di altri cereali, garantiva, trovandosi al centro di un sistema di commerci, l'approvvigionamento del mondo romano, raccolto in centri urbani densamente abitati.

In seguito alle invasioni questo sistema dovette andare almeno in parte in crisi, perché basato su una centralizzazione del sistema produttivo, articolato sul commercio degli alimenti su base continentale e sulla presenza di un ceto proprietario aristocratico legato al mondo romano. Questo impatto dovette diminuire sensibilmente la produttività delle aziende cerealicole, mandandole in crisi anche laddove non venne effettuata una loro distruzione o una loro dismissione. L'incolto si appropriò di vaste aree territoriali e molti centri urbani, sia per l'attività bellica, sia per l'afflusso di nuove popolazioni abituate ad un diverso sistema sociale e di alimentazione decaddero[1].

Questo quadro probabilmente, con differenti peculiarità, accomunò tra loro le province dell' impero romano d'Occidente che vissero, in misura diversa, la crisi del sistema produttivo agricolo tardoantico.

A questo punto, cosa avvenne ? Si ebbe una spinta generalizzata all'autoconsumo o vi furono tentativi di ritorno alla centralizzazione e all'organizzazione della produzione... e con quali esiti? quali modelli rurali e alimentari si diffusero, con quali caratteristiche ?

Il bovino è l'animale che, assunto a parametro di questa crisi e di questo nuovo inizio dell'agricoltura, consente forse di impostare alcune risposte; per la sua forza-lavoro, é l'animale fondamentale per la produzione cerealicola; ma allo stesso tempo può essere un formidabile produttore di came e può consentire all'uomo di assumere calcio, proteine e grasso dal suo latte.

Il tipo di allevamento a cui è sottoposto determina però una specifica funzione: allo stesso modo, a seconda del suo sfruttamento, verrà macellato ad una certa età; inoltre anche la sua mole va messa in rapporto alla scelta produttiva in cui è confinato.

Cosa accadde quindi al bovino nell'età altomedievale? Fu allevato per la carne, o per la produzione del latte, oppure venne utilizzato per la coltivazione dei campi, e ucciso quindi soltanto alla fine della sua attività, come "bestia inutile"?

Si possono osservare differenze regionali, riguardo alla sua presenza ed al suo sfruttamento? Quale fu il suo contributo (diretto o indiretto) all' alimentazione delle popolazioni rurali medievali, con quali risultati?

Pur tenendo conto della complessità delle questioni, si cercherà di delineare alcune risposte. Si utilizzeranno dati faunistici, antropologici e ceramologici provenienti dall'Italia, per metterli poi a confronto con alcuni dati francesi e inglesi.

1 Il bovino nell'età tardoantica

Lo scavo di Calvatone (presso Cremona) in Italia Settentrionale, ha mostrato quello che si può definire come lo specchio fedele di un centro tardoantico a specializzazione cerealicola[2]. In questo centro del secolo V, I bovini erano in maggioranza macellati in età estremamente avanzata; si può parlare senza dubbio di "bestiae inutiles".

I resti faunisticí di Calvatone hanno restituito almeno 27 bovini (e altri animali rappresentati in modo del tutto minoritario); per la gran parte si tratta di animali macellati dopo i 5-10 anni (secondo il livello di usura dentaria) ma va notato che moltissimi frammenti sembrano appartenere ad individui uccisi

[1] Sul modello alimentare delle popolazioni germaniche si veda: H. WURM, Konstitution und Ernährung IV: Körperhöhen und Langenbreitenindices bei volkerwanderungszeitlich-frühmittelalterlichen nordischen und germanischen Stammesverbanden, in: *Homo* 40, 1989, 3-4, 186-213.

[2] Sena Chiesa, Wilkens 1990.

dopo questa età, con almeno due animali di 12-13 anni, uno di 14-15 e uno di 16 anni.

Questi dati paiono coerenti con quelli provenienti da molti altri centri che rispecchiano una simile "specializzazione" cerealicola. Solo per fare alcuni esempi, una simile età di macellazione (con un bovino di 20 anni) si registra nelle tardoantiche La-Bourse (presso Marsiglia) e Volano (Italia settentrionale); anche nelle fasi bizantine di Gortina (Creta) vi sono diversi animali uccisi a 10 anni e anche più (almeno uno aveva 14-15 ami)[3]. Il predominio numerico dei maschi/castrati (per quanto in molti casi non facilmente distinguibili) è netto e, quanto alla mole delle bestie, senza dubbio si tratta di animali sottoposti ad attenta selezione. Insomma Calvatone e tantissimi altri centri ben rappresentano luoghi di forte produzione cerealicola, dove si utilizzano buoi di grande mole opportunamente selezionati per l'aratro e dove questi non erano uccisi che alla fine della loro attività lavorativa, a scapito della carne[4].

2 Il bovino nell'età medievale

E' importante ora prendere in esame i principali parametri utili a mettere in evidenza la nuova condizione del bovino medievale:

1) L'età di macellazione
2) Il consumo delle carni
3) La forza disponibile per il lavoro
4) La produzione del latte.

2.1 L'età di macellazione del bovino medievale

Riguardo i siti medievali italiani, nella gran parte dei casi l'età di morte del bovino sembra maggioritariamente attestarsi a partire dai due/tre anni senza raggiungere con grande frequenza i 7/8[5]. Solo in qualche caso, comunque significativo, è possibile rinvenire bovini macellati probabilmente intorno ai 10 anni di età. In questi casi ci si trova davanti ad aziende curtensi legate a grandi monasteri, con una gestione complessa e organica che contribuì allo sviluppo di un pur minimo livello di specializzazione degli animali[6].

Ma che impatto ebbero sul mondo agricolo queste aziende "specializzate" e quali sono le differenze, ravvisabili dai resti faunistici, rispetto alle aziende cerealicole tardoantiche?

E' importante notare da subito che mentre in Francia esistono casi di aziende a specializzazione decisamente cerealicola (basti per ora accennare al fatto che a Saint-Denis, tra VII e X secolo si raggiunge un 70% di apporto carneo bovino e si tratta di animali uccisi dopo i 10 anni), in Italia si possono trovare, al massimo, centri di produzione "intensiva e diversificata"; tra questi si possono forse citare Torcello, molti dei centri legati a S.Giulia a Brescia e un'altra azienda presso Imola.

In questi ultimi centri i bovini possono talvolta aver raggiunto l'età di morte di Calvatone e Saint-Denis, senza però arrivare mai a coprire il 70-80% dell'apporto di carne disponibile; questo apporto è invece quantificabile intorno al 50%, percentuale che – dato estremamente significativo – risulta assolutamente coerente con quella registrata nella grande maggioranza dei siti medievali italiani, sia villaggi rurali, fortificazioni militari o importanti centri urbani[7]. In queste "aziende curtensi" si riscontrano percentuali particolarmente elevate di suini, allevati ovviamente per la came, sottoposti a selezione e cure utili al loro massimo sfruttamento commerciale[8].

Tutto ciò sembra indicare che in Italia le aziende produttive sostanzialmente ripropongano (con una maggiore "specializzazione" nel massiccio allevamento dei suini per la carne e nella produzione di cereali pregiati) il modello almeno in parte "silvopastorale" diffuso nell'intera Italia dell'alto e pieno medioevo. Nelle aziende si rispecchia ingrandita quella coesistenza tra le specie animali e quel tipo de

[3] Sul sito di La-Bourse si veda Jourdan 1976; su Volano e altri centri dell'Italia settentrionale si veda Riedel 1986; i livelli bizantini di Gortina sono stati studiati da B. Wilkens e sono citati in Sena Chiesa, Wilkens 1990, 318.

[4] A Calvatone un metatarso femminile ha indicato per una vacca un'altezza di 125 cm.: Sena Chiesa, Wilkens 1990.

[5] Per la bibliografia dei siti medievali italiani che hanno restituito dati faunistici si veda Giovannini in stampa (*Funzioni...*): anche se in diversi casi non è stato possibile determinarla con precisione, l'età di morte dei bovini sembra indicare in genere bovini maturo-adulti non confrontabili, per decrepitezza, con quelli d'età tardoantica.

[6] I casi in cui si trovano bovini macellati anche oltre i 10 anni sono rari ma significativi: si tratta (forse) dell'azienda di Torcello (Riedel 1986) e di un'azienda presso Imola (Farello 1990).

[7] Le percentuali di presenza e di apporto carneo delle principali tre specie animali rinvenute in oltre 10 siti medievali italiani (Tabella 1 in Giovannini in stampa (*Funzioni...*)) indica per il bovino una presenza oscillante tra il 10 e il 20% circa e un apporto carneo tra il 40 e il 60%.

[8] Riguardo alla specializzazione per la produzione di carne suina si veda Torcello (Riedel 1986, 97). La produzione dei suini era però anche una caratteristica dell'Italia centromeridionale sin dall'età tardoantica (Barnish 1987) ripresa poi nelle domusculte pontificie.

allevamento almeno in parte semi-brado che è tipico del modello agrario-alimentare medievale, che non marginalizza il bovino. Le grandi aziende produttive della Pianura Padana sembrano insomma inserite nella logica rurale coeva; vi si può forse cogliere un minimo livello di specializzazione del bovino, ma non va dimenticato che qeste grandi aziende erano connesse ad abbazie e monasteri e quindi non rappresentano, per motivi religiosi, centri diretti di forte consumo carneo[9].

Ma come si comportava la gran parte del mondo rurale medievale, quello più legato all'autoconsumo?

I dati archeozoologici come si diceva, indicano un'età di macellazione dei bovini che sembra situarsi tra i 2 anni e 1/2, età classica per l'allevamento carneo, e i 4, forse 5 anni, senza raggiungere i 10 e più anni che caratterizzano le 'bestie inutili', utilizzate come pura forza-lavoro nella coltivazione.

Dato che bovini macellati intorno ai 4-5 anni fanno immaginare un superamento dell'età stabilita per una produzione rivolta alla carne, si è spesso pensato che anche in questi casi si tratassi di "animali da lavoro". Ma se dai centri tardoantichi e bizantini provengono bovini macellati ben al di sopra dei 5 anni, spesso tra i 10 e i 20, quest'età di morte non sembra essere praticamente mai raggiunta nei centri medievali italiani, soprattutto in quelli rurali.

All'identificazione degli animali macellati in età "molto matura" (4-6 anni) con quelli "adulto-senili" (cioè le "bestie inutili") hanno contribuito una serie di fattori:

1) Innanzitutto la metodologia cui si è costretti per stabilire l'età di morte: si basa sulla fusione delle epifisi delle ossa lunghe e sull'eruzione dentaria[10]; si tenga conto però che l'ultimo molare (M3) emerge a circa 24-28 mesi; dopo questa età, il livello di usura dentaria rappresenta uno dei pochissimi aspetti macroscopici che consente una buona individuazione dell'età di morte: è un caso che esso risulta visibile solo nei resti faunistici tardoantichi? esistono infatti esempi di tale analisi condotta anche su resti d'età posteriore come (oltre ai casi delle "aziende" citati) nella siciliana Fiumedinisi, la veneta Rocca d'Asolo e a Roma, e qui le divergenze rispetto ai secoli precedenti risultano evidenti[11].

2) Un secondo aspetto è quello dell'uso di parametri "culturali' relativi a bovini d'età classica o moderna, per cui l'età di morte ottimale per la carne si ferma ai 2 e 1/2 - 3 anni. In quelle epoche la specializzazione agraria tra bovini da carne, da lavoro e da latte si rifletteva chiaramente sull'età di morte; le bestie uccise dopo i 2/3 anni erano quindi in effetti usate per la produzione del latte, o per l'uso come forza lavoro. Il dimorfismo sessuale legato alla specializzazione e alla selezione degli animali tardoantichi favoriva in questo caso l'identificazione dei buoi dalle vacche da latte. Ma per l'età medievale – con l'attestata diminuzione della mole degli animali – tale lettura è molto più discutibile.

3) Un altro fattore deriva dall'adesione delle diverse ipotesi storiche sul mondo agrario e alimentare medievale (sia "catastrofiste" che "ottimiste"[12]) all' ídea di una grande rarità e preziosità del bovino, che s'immaginava primariamente utilizzato – a scapito della carne – nel difficoltoso lavoro dei campi e quindi come animale da lavoro, derivando il contributo carneo (più o meno disponibile, a seconda degli orientamenti degli storici) dai suini.

Un bovino macellato dopo i 4/5 anni, soprattutto in età medievale, può indicare:

1) Un maschio che aveva raggiunto l'età del massimo sviluppo muscolare; e che – in seguito ad un surplus di maschi – invece di essere castrato veniva macellato (in ambito rurale anche tra i 3 e 1/2-4 ami).

2) Una femmina che dopo aver partorito e allattato veniva macellata una volta che il vitello aveva raggiunto 1 anno e quindi poteva dare un contributo al lavoro dei campi.

3) Una bestia ormai inutile per il lavoro dei campi, cui l'attuale metodologia non riesce che a dare il termine "post quem".

4) Una mucca da latte: produttiva fino ai 7/8 anni e anche più.

5) Un animale da carne: sia per la diminuzione della mole che per le ridotte possibilità di alimentazione degli animali, l'"ingrasso" era probabilmente rallentato rispetto ai tempi antichi e odierni.

Oltre a questi fondamentali aspetti, il tipo di cottura cui erano sottoposte le carni e le dimensioni fisiche dell'animale potrebbero contribuire ancor di

[9] Per i centri monastici si può immaginare una certa preferenza verso il consumo dei cereali, o comunque un minore interesse verso la carne bovina, visto l'orientamento vegetariano di molti ordini.

[10] Esistono diverse valutazioni per l'attribuzione dell'età di morte attraverso la saldatura delle epifisi delle ossa lunghe e l'eruzione dentaria: si vedano i lavori e la bibliografia di F. Audoin-Rouzeau (1986 e 1993).

[11] Su Fiumedinisi (Sicilia) si veda Villari 1988, 633; su Rocca d'Asolo (Veneto): Bedini 1990, 342; su Roma il lavoro di E. Bedini in Crypta Balbi 1990, 623-638.

[12] Sia le ipotesi storiografiche più pessimiste (Duby 1961) che quelle più ottimiste sulla condizione alimentare altomedievale europea e italiana (Montanari 1979) immaginano una grande rarità dei bovini, un loro circoscritto utilizzo per il lavoro dei campi e un forte predominio del suino.

più a ricondurre entro specifici caratteri "medievali" il tipo di sfruttamento del bovino, e quindi a riconsiderare più opportunamente il rapporto tra il suo utilizzo e la sua età di macellazione.

2.2 Il consumo delle carni bovine

Bisogna sottolineare un dato molto significativo che potrebbe restituire l'immagine della presenza del bovino nell'Italía medievale in una luce diversa: l'esteso uso della bollitura/lessatura come metodo per la cottura dei cibi.

Verso questa idea non solo propendono gli studi delle ceramiche da fuoco, che indicano come tra VI-VII e XIII-XIV secolo, sull'intera penisola le pentole/olle globulari fossero massicciamente utilizzate per la cottura degli alimenti[13] ma anche le tracce di macellazione e di cottura riscontrate sulle ossa rinvenute in diversi siti.

Non soltanto in molti casi i resti faunistici dei bovini recano traccia di questa cottura per lessatura, ma in certi casi, corrispondono nel loro taglio alla grandezza delle bocche delle forme da cucina[14].

Ma il fatto più importante è che non solo la carne bovina veniva lessata, ma anche quella del suini, degli ovini e della cacciagione, indifferentemente dall'età di morte (e quindi dalla sua durezza) veniva in genere bollita[15]. Alcuni tagli venivano certamente conservati (essiccati, salati, affumicati, etc.[16]) ma in generale si coglie bene questo predominio della lessatura: in questo quadro – visto che la carne bovina era quantitativamente fondamentale – la durezza della carne, vista la non giovane età di morte degli animali, non costituiva un elemento così importante: se la si bolle, non c'è grande differenza tra la carne di una bestia di 2 anni e 1/2 e una di 5 anni. Sul perché fosse diffuso così tanto in Italia medievale questo uso della lessatura della carne – che è poi il nucleo centrale di ogni ricostruzione agraria e alimentare sull'epoca – si tornerà dopo.

Si è già accennato al fatto che la percentuale di apporto carneo derivante dai bovini costituisce una buona metà del patrimonio proteico delle popolazioni rurali italiane nel medioevo. E' l'uniformità territoriale del dato a colpire: tra alto medioevo e basso-medioevo, sia nell'Italia padana che nelle aree meridionali, la percentuale di carne commestibile disponibile nei centri rurali (e non) italiani è rappresentata per più del 50 % dai soli bovini.

Rari e preziosi solo per i lavori agricoli, quindi?

Non proprio: abbastanza rari, ma sempre presenti; invece la preziosità della loro carne è senza dubbio evidente, visto che i resti antropologici sembrano segnalare un discreto livello di alimentazione carnea nelle popolazioni italiane medievali nelle diverse aree, certamente maggiore – anche per la disponibilità di cacciagione, di carne suine conservate e altro – rispetto all'età classica o rinascimentale, per non parlare dell'età moderna[17].

Usati quindi solo per la produzione della carne, e uccisi in età maturo-adulta solo per il modo di cottura, che non faceva preferire la carni più tenere?

Molto probabilmente no: l'utilizzo del bovino come forza-lavoro era comunque centrale nell'economia rurale medievale. Perché – anche qui i dati antropologici italiani sembrano abbastanza chiari – il consumo di alimenti cerealicoli, nonostante il discreto contributo proteico derivante dalla carne, non dovette subire in età medievale una brusca diminuzione: e non solo nelle aree più legate al mondo bizantino o arabo, ma anche nell'Italia padana e subalpina[18].

I parametri antropologici indicano che, dove si registra una discreta condizione di alimentazione (nella maggioranza dei siti medievali italiani), questa è contraddistinta da un certo equilibrio tra alimenti cerealicoli (assunti soprattutto come focacce di grano e come zuppe) e alimenti carnei, lessati in brodi come

---

[13] Sulla diffusione delle pentole per la lessatura/bollitura, si veda Giovannini in stampa (*Funzioni...*).

[14] Le tracce della lessatura sulle ossa sono state rinvenute, per esempio, a Brucato (Beck-Bossard 1981) e a S. Michele a Trino (Ferro 1991); sul rapporto tra taglio delle ossa e aperture forme da cucina si veda: Brucato 1984.

[15] Tale costume è documentato sia in Italia settentrionale (Ferro 1991) che in Italia meridionale (Brucato 1984 e Villari 1988); Riguardo l'età di macellazione degli animali a S. Michele a Trino (Italia Nord-Ovest), le tre specie domestiche erano "*tutte allevate essenzialmente per lo sfruttamento delle risorse carnee...*"; si pensi che cervo, caprioli e cinghiali contribuivano per l'8.5% all'apporto carneo locale (Ferro 1991, 413); nonostante ciò "*la cottura della carne sembra essere avvenuta pleferibilmente per bollitura...*" (p. 414). Anche nelle siciliane Brucato e Fiumedinisi vengono bollite carni di cervi, lepri, maiali, cinghiali e bovini: e quest'ultimi indifferentemente siano di due o più anni.

[16] Sul consumo di carne secca in età medievale (di cui esiste anche una certa documentazione archeologica) e, più in generale, il problema della conservazione dei cibi si veda la discussione in Giovannini in stampa (*Funzioni...*).

[17] Il buon livello di alimentazione carneo nelle popolazioni medievali italiane (intuito e argomentato da Montanari già nel 1979) lo si può ipotizzare anche sulla base di una ormai non più esigua serie di dati antropologici: per une sintetica esposizione si veda Giovannini in stampa (*Funzioni...*).

[18] Sul calo non drastico, anche in Italia settentrionale (e in Gallia), del contributo dei cereali all'alimentazione medievale anche dopo l'afflusso di popolazioni germaniche si veda Giovannini in stampa (*L'impatto...*).

came fresca o essiccata: questi alimenti complementari tra loro sia dal punto di vista culinario che alimentare – nonostante alcune controindicazioni – sembrano aver consentito un buon livello di sostentamento[19].

Così come l'incontro tra apporto carneo e apporto cerealicolo sembra contraddistinguere il modello alimentare medievale rurale, l'integrazione tra bovino da carne e da lavoro (su quello da latte si dirà più avanti) sembra evidente soprattutto nell'età di macellazione dell'animale. E' immaginabile quindi che questo modello alimentare e agricolo abbia riscontro in una età di macellazione dei bovini che risponda alla sua duplice valenza agrario-alimentare; quindi anch'esso a metà strada: un'età di macellazione tra i 3 e i 5/6 anni quindi, sembra consentire lo sviluppo massimo dell'animale, in un regime alimentare ben lontano da quello orientato al puro allevamento per la carne, e che anzi implicava almeno duetre stagioni di sfruttamento intensivo del bovino per la coltivazione dei campi. Allo stesso tempo quest' età fa pensare (soprattutto per piccoli villaggi agricoli) al lasso di tempo necessario per reintegrare e far sviluppare un nuovo piccolo gregge di bovini, cui far prendere, nel ciclo lavorativo, il posto di quelli destinati al consumo.

2.3 La mole degli animali medievali

La diminuzione della mole degli animali medievali rispetto a quelli d'età classica sembra anch'essa evidenziarsi sulla base degli scavi archeologici[20].

Oltre alla statura probabilmente anche la robustezza delle ossa doveva essere differente da quella dei bovini "classici": anche se è molto difficile da identificare, costretta a basarsi su pochissimi resti ossei, anche questa va messa in evidenza: perché molto probabilmente il bovino medievale doveva avere una costituzione fisica molto differente da quello precedente e successivo: se una diminuzione dell'altezza al garrese, oltre che documentata, è anche immaginabile – visto che con la fine della selezione attuata dalle aziende cerealicole per allevare buoi da lavoro sempre più giganteschi e forti vi dovette essere una generalizzata diminuzione della statura bovina – dobbiamo immaginare, soprattutto nei centri rurali, un tipo di allevamento dei bovini molto vicino a quello dei suini o degli ovino-caprini: cioè "semi-brado"[21]. E ciò non solo per la difficoltà ad allevare in stalle gli animali e rifornirli di erbe specifiche, ma anche perché nei piccoli villaggi (quelli dove si sviluppò positivamente il modello rurale alimentare italiano nell'altomedioevo) dove la gestione del gregge poteva spesso essere collettiva[22], potevano essere lasciate brucare (in un ambiente profondamente dominato dall'incolto) al limiti dei boschi, negli vasti spazi agrari messi a riposo o non coltivati, un pò come i suini venivano fatti mangiare nei boschi. In questo quadro, che probabilmente formò nei primi secoli del medioevo il "nuovo" bovino che riuniva in sè quello da carne e quello da lavoro (e forse quello da latte), si dovette assistere ad una diminuzione della statura, e forse anche ad un irrobustimento osseo[23]; si possono quindi immaginare tipici di questo animale anche altri caratteri legati ad un certo "rinselvatichimento" della specie: scarso dimorfismo sessuale, resistenza alle intemperie, carattere più reattivo (o addirittua aggressivo); una sorta di "bovino semiselvatico".

Quando poi fu rilanciata la specializzazione nelle aziende cerealicole, il bovino fu presto sottoposto ad una selezione che ne mutò di nuovo l'aspetto. Ma dove invece il bovino restò la base multifunzionale della vita rurale (nei piccoli centri rurali e in vaste aree dell'Italia medievale) il suo mutamento fu con tutta probabilità decisamente più lento.

---

[19] Sulle controindicazioni nutrizionali di alcuni alimenti massicciamente utilizzati nell'alimentazione medievale italiana (soprattutto la focaccia di cereali poco lievitata) si veda Giovannini in stampa (*Funzioni...*) sulla base di analisi e ricerche di G. Fornaciari *et al.* (1980 e 1984).
Un buon livello di nutrizione sembra sempre accompagnarsi ad un certo equilibrio tra contributo della carne e dei cereali: laddove si registra una condizione alimentare deficitaria, come a S. Pietro Cavallermaggiore (Cuneo) o a Cornus (Cagliari), si trova una scarsezza di ambedue gli apporti: ma si tratta di eccezioni (almeno fino ad ora) nel panorama abbastanza positivo, dal punto di vista alimentare, dell'alto/pieno medioevo italiano, così come è ricavabile dai dati antropologici relativi a Mola di Monte Gelato, Castro dei Volsci, San Michele a Trino, Villaro del Ticineto, Testona, Aosta, Paciuri, Venosa, Pordenone, Siena, Caliata, Rocca d'Asolo, Roma (si veda bibliografia in Giovannini in stampa (*L'impatto...*); importanti i dati pubblicati a p. 262 di Bartoli 1992).

[20] In Villari 1988, tabella 10, p. 635: dal calcolo di metapodi, si sono ricavate le seguenti misure di altezza dei bovini, per varie epoche: (sec. XIV) Fiumedinisi 1190.0, (sec. XIV) Brucato 1157.3, (secc. IX-XII) Ponte Nepesino 1135.2, (secc. XII-XV) Torcello 1135.5; nel sito di IV-V AC di Lipari le misure erano di 1213.0 e in quello del Neolitico Medio di Stentinello si raggiungono i 1211.5. Audoin-Rozeau per La-Charitè-Sur-Loire (1986, 66) ha calcolato la mole del bovino di XII secolo intorno ai 115-116 cm.

[21] Sull'allevamnento non stallatico degli animali in età medievale: Montanari 1979, 222-223.

[22] Dal punto di vista archeologico si vedano le importanti osservazioni di G. Clark per Ponte Nepesino (1984).

[23] Riguardo la mole del bovino che, se con il passare dei secoli aumenta di statura, sembra perdere inrobustezza: Audoin-Rouzeau 1986, 66.

Di questo quaào bisogna tenere conto nel calcolo del suo potenziale di carne commestibile: valutando però che questo 'rinselvatichimento' altomedievale, senza dubbio importante nel bovino, fu ancor più sensibile nel suino, e forse – in misura minore – anche negli ovino-caprini: nel generale calo di mole, i rapporti di carne commestibile calcolati tra queste tre specie domestiche probabilmente quindi dovettero rimanere stabili[24].

2.4 La produzione e il consumo del latte

Occorre almeno provare ad affrontare la questione della diffusione del bovino da latte nel mondo rurale medievale; le fonti purtroppo non sembrano in grado di delineare un chiaro quadro della sua presenza; nonostante ciò è forse possibile ricavare dai dati faunistici una serie di indicazioni:
1) sembra di assistere in molti casi ad un basso livello di dimorfisino sessuale tra bovini (anche se la frammentarietà del resti ossei non consente di esserne sempre certi);
2) la diminuzione di mole anche laddove altri animali sembrano selezionati con efficacia, sembra indicare una frequente mancanza d'interesse specifico verso i bovini da parte di aziende con un certo grado di specializzazione[25];
3) la coesistenza delle tre specie principali in tutti i centri e villaggi rurali rende ipotizzabile un tipo di allevamento in molti casi (probabilmente la stragrande maggioranza) semi-brado;
4) l'età di macellazione dei bovini non sembra far pensare ad un frequente allevamento "specifico" di mucche da latte (sono animali che possono continuare a produrre latte anche dopo i 7/8 anni).
Insieme ai dati antropologici e storico-demografici, queste indicazioni forse consentono di presentare alcune ipotesi.

Il consumo di latte vaccino nell'Italia medievale sembra essere stato, nonostante i caratteri rurali orientati all'autoconsumo, estremamente ridotto. Per una serie di motivi intrecciati strettamente fra loro:
1) Motivo "igienico". Non sapendo che l'ebollizione del latte provoca l'abbattimento del livello batteriologico, ancora in età bassomedievale e rinascimentale questo alimento era considerato facile veicolo di epidemie e di malattie. Tanto più pericoloso per il divezzamento dei bambini, che quindi erano sottoposti ad una prolungata lattazione materna, senza dubbio più sicura dal punto di vista sanitario.
2) Motivo "sessuale". La lattazione prolungata da parte delle madri è una nota consuetudine rurale, molto diffusa in età medievale; insieme alla motivazione "igienica" doveva essere molto comune l'idea, che ha una sua base fisiologico-ormonale, dell' assenza (in verità riduzione) della fertilità della donna in fase di allattamento. Allo stato attuale degli studi storici non è possibile capire appieno se era ritenuta una valida pratica anticoncezionale (bisogna considerare l'avversione del cristianesimo verso pratiche anticoncezionali diffuse nei secoli precedenti[26]) e quindi la lattazione prolungata fosse perseguita a questo scopo, oppure se esistevano tabù sessuali legati alla donna in allattamento (così come sono sempre esistiti per la donna in stato interessante o in fase mestruale). Nel primo caso il risultato poteva essere una scarsa necessità di latte animale per il divezzamento dei bambini.
3) Motivo "economico". Il latte più utile per il divezzamento umano è quello vaccino, ma la disponibilità di questo è legato ad una scelta produttiva costosa: la gran parte delle specie bovine infatti per produrre latte hanno bisogno di un'alimentazione abbastanza specifica e di un regime di allevamento orientato a questa produzione: foraggio di un certo tipo, allevamento delle mucche in ambienti in cui, almeno durante il giorno, siano assenti i vitelli. Queste due condizioni, difficilmente perseguibili in piccoli villaggi rurali, sono infatti necessarie affinché vi sia una buona disponibilità di latte (soprattutto se si tratta di animali di piccola mole) e affinché il latte sia dato al mungitore e non ai vitelli, ai quali le mucche hanno naturale tendenza a cederlo.

Ovviamente vi era buona disponibilità di latte prodotto da pecore e da capre; ma il latte delle pecore non è un buon sostituto di quello materno (per l'alto contenuto in lattosio, oltre che per il sapore). Migliore é quello di capra, animale che per diffusione non sembra però paragonabile alla pecora, e quello d'asina, che non appare così presente nel panorama medievale da far un suo significativo impatto[27].

Per la vita rurale invece era molto conveniente la transformazione del latte ovino e caprino in for-

[24] Sulla somiglianza del suino medievale al cinghiale sia per l'aspetto che per la diminuita mole si veda Montanari 1979, 236-237.

[25] A Torcello (Riedel 1986) dove i suini sono di mole notevole, i bovini hanno una taglia coerente con quella di altri centri padani.

[26] Tannahill 1980, 139.

[27] Come esempio, valga il fatto che i dati amministrativi dell'azienda curtense altomedievale di Santa Giulia in Brescia (Montanari 1979, 224) indicano per le pecore una presenza del 40.9 % sul totale delle specie, mentre le capre rapresentano il 3.7 %. Gli asini arrivano a malapena allo 0.4 %.

maggio; una volta trasformato era conservabile molto a lungo, igienicamente più sicuro, più tollerabile per l'organismo (per il diminuito livello di lattosio, spesso indigesto per molte popolazioni umane in fase post-lattazione, in specialmodo per quelle più mediterranee), commerciabile e consumabile in stagioni di diminuita disponibilità delle risorse alimentari naturali.

Il bovino d'altra parte poteva essere usato, sia maschio che femmina, per il lavoro dei campi: e le mucche erano importanti sia per la disponibilità secondaria alla forza lavoro e alla produzione di carne, che per la primaria funzione – decisiva per un gruppo circoscritto di animali domestici – della generazione dei vitelli e del loro svezzamento, consentendo in questo modo il costante ritorno ad un gruppo minimo d'individui utili al sostentamento, sia alimentare che produttivo, dei ridotti villaggi rurali.

Questo basso interesse per il latte bovino ha avuto quindi probabilmente delle importanti conseguenze su molti gruppi umaní d'età medievale dell'area mediterranea:

1) Ha fatto sviluppare un modo d'allevamento "semiselvatico", che garantiva la riproduzione dei bovini senza che questa pesasse troppo sui ritmi agrari dei villaggi. Questo tipo di allevamento ha prodotto un basso dimorfismo sessuale tra maschi/maschi castrati/mucche, perché tutti egualmente usati nel lavoro dei campi, e ha appiattito in genere l'età di macellazione sul ritmo riproduttivo del gruppo di bovini disponibili per ogni centro rurale.

2) Può aver contribuito, anche solo in parte, a rallentare l'incremento demografico umano in età medievale, visto che non sostituendo il latte materno con quello vaccino si prolungava il periodo di ridotta fertilità femminile. Legato anche a motivazioni ben più importanti (diffusione dell'endogamia, debolezza biologica nei confronti di "virus" esterni, usi collettivi di ambienti e oggetti), altomedíoevo e medioevo italiano, anche a fronte di una certa disponibilità alimentare, non sembrano aver conosciuto uno sviluppo demografico rilevante: la mancanza di latte vaccino può essere uno dei motivi, anche se è difficile capire se si sia dipeso dalla scarsa diffusione delle mucche da latte o se viceversa l'abbia accentuata.

3) La carenza di latte vaccino ha indotto all'adozione per i bambini, dopo una lattazione prolungata più a lungo possibile, dell'alimentazione riservata agli adulti, spesso equilibrata, ma con caratteristiche antinutrizionali legate ai cereali poco lievitati e mal cotti che avevano un diretto impatto sui bambini nell'età del primo sviluppo, provocando in molti casi stress nutrizionali e talvolta anemíe sideropeniche anche laddove gli adulti sembravano aver raggiunto un livello di sostentamento accettabile.

3 Francia, Inghilterra: un diverso modello di sfruttamento dei bovini

Se questo è il quadro ipotizzabile per l'area italiana e meditenanea in generale, si possono rintracciare diverse condizioni di vita, sempre in rapporto con lo sfruttamento del bovino, in diverse aree territoriali, comunque legate alla crisi dei secoli V-VI?

3.1 La Francia altomedievale tra modello urbano e modello rurale

Se le aziende curtensi altomedievali italiane sembrano rispecchiare, nonostante lo sviluppo commerciale e produttivo, un modello comunque legato al mondo silvopastorale, la realtà francese rìsulta decisamente diversificata.

La Francia sembra aver portato avanti sia m modello rurale basato sull'autoconsumo (con discreti risultati di sussistenza), che centri a specializzazione cerealicola, decisamente difficili da trovare nell' Italia coeva. Anche i dati antropologici francesi, ad una pur superficiale lettura, non sembrano mostrare una uniformità del modello alimentare e quindi rurale nella Francia altomedievale.

I non rari dati scheletrici hanno offerto agli antropologi l'immagine di una certa diversità nelle condizioni fisiche di gruppi umani anche territorialmente vicini tra loro, nello stesso arco cronologico, senza che sia registrabile una consistente presenza allogena.

Sia nella bassa Normandia (Giberville, Sannerville, Saint-Martin) o nel Nordovest (Les-Rues-des-Vignes), ma anche nell'area provenzale (Vaison-la-romaine, Cadarache) si riscontrano condizioni molto differenti, nello sviluppo dei gruppi rurali, tra VI e VIII secolo[28].

Nella Francia settentrìonale, come testimoniato anche dalle fonti storiche, anche fonti archeologiche segnalano che con l'età carolingia si assiste ad una iniziativa centralistica finalizzata allo sviluppo di aziende agricole; che, dal punto di vista organizzativo, sembrano riprendere alcuni caratteri tardoantichi. Il villaggio agricolo di Villiers-le-Sec (secc. VII-XI), legata strettamente all'Abbazia di Saint-Denis, presenta caratteri, per età di macellazion degli animali, presenza delle specie, modello alimentare

[28] Per la discussione su alcuni dati antropologici altomedievali riferiti alla Francia si veda in Giovannini in stampa (*L'impatto...*); come lavoro esemplarmente ricco di dati e informazioni: *La nécropole de Saint-Martin-de-Fontanay...* (a cura di C. PILET), Paris, 1994.

degli abitanti, tipo di sfruttamento degli animali, molto vicini a quelli delle aziende galloromane e italiche degli ultimi secoli dell'impero[29]; e questo sembra evidente sopratutto dal bovino. La mole degli animali, passa da 1.30/1.60 del bovino galloromano ai 1.17 di quello medievale (comunque superiore, anche se di poco, agli animali gallici). Di conseguenza il peso degli animali vivi registra una notevole diminuzione (circa 270 Kg.). Riguardo alla presenza della specie, la percentuale di bovini già molto alta nel secolo VI (36%), tende ad aumentare col paasare dei secoli (secolo XI: 44%). Questo andamento sembra simile anche in altri siti della Francia centrosettentrionale. L'età di macellazione dei bovini è però il dato più significativo: 1/3 dei bovini viene macellato intorno ai 15/18 mesi; ma a parte qualche individuo ucciso a 6/7 anni, la maggior parte dei bovini viene macellata ad un'età superiore ai 10 anni[30]. Anche se qui non è stato possibile stabilire (per l'insufficienza dei dati) il rapporto tra maschi e femmine, J.-H. Ivinec cita l'Inventario carolingio di Annapes per segnalare come, in quest' area geografica, i tori fossero molto pochi e buoi e mucche fossero presenti in alte quantità equivalenti.

Relativamente all'apporto carneo disponibile nel centro, nonostante la diminuzione di mole e peso, i bovini rappresentano all'incirca il 70% della carne disponibile, seguiti poi dai suini, mentre la selvaggina non pare rappresentata significativamente. A questa analisi faunistica vanno aggiunti i risultati delle analisi antropologiche che segnalano uno scarso consumo di alimenti carnei, cui fa invece contraltare un preponderante consumo di alimenti cerealicoli.

Le fonti storiche permettono di mettere in evidenza che (visto che la villa di Villiers-le-Sec era alle dipendenze dell'Abbazia di Saint-Denis) i canoni in prodotti dovuti all'abbazia erano essenzialmente: burro, volatili, uova, carne di maiale. La "carne pregiata" (intesa come apporto di proteine animali) destinata dai contadini di Villiers-le-Sec ai monaci dell'Abbazia, era quindi costituita da carne suina, molte uova e burro: anche se la produttività delle galline ovaiole e delle mucche da latte doveva essere abbastanza bassa, molti animalì erano quindi destinati a questo utilizzo[31].

La produzione (e l'alimentazione) cerealicola era quindi l'interesse centrale del centro carolingio di Saint-Denis, come ben attestato dai dati faunistici; se si considera l'indubbia diminuzione della loro mole (e quindi della loro forza-lavoro) ecco che i dati fiscali relativi all'età carolingia, con basse rese dei campi, hanno una loro evidente spiegazime: se si cercò, in età altomedievale e medievale, di riprendere un modello produttivo agrario di impronta tardoantica con strumenti di lavoro (il bue per primo) decisamente compromessi, è ben possibile comprendere le condizioni fisiche in molti casi carenziali delle popolazioni di molti centri rurali d'area franca.

Altri dati provengono da un centro agricolo legato ad un abbazia lungo la Loira, La-Charitè-sur-Loire, con fasi relative ai secoli XI-XV[32]. I pur rari resti, mostrano che nelle fasi medievali i bovini sono macellati in età matura, tra i 3,5/5 anni, mentre i vitelli sono praticamente assenti; questi aumentano invece nelle fasi postmedievali (accordandosi ad un generale aumento del consumo dì vitelli nelle fasi postmedievali inglesi (Audoin-Rouzeau 1986, 109). Anche qui non è stato possibile effettuare la ripartizione sessuale.

Stuchando anche le altre specie animali presenti, la Audoin-Rouzeau immagina per il monastero una dieta orientata all'alimentazione carnea di qualità; e questo anche perché nel sito mancano in genere le teste degli animali; ciò, oltre a comportare un ostacolo alla stima dell'età di morte, testimonia la scelta della carne migliore, con esclusione di cervello e lingua, consumate probabilmente da abitanti più poveri, forse dei dintorni[33].

Anche qui i bovini, nonostante una non elevata presenza (però coerente nei secoli) rappresentano sempre la carne quantitativamente più disponibile.

Se è vero che l'impossibilità di un esame della dentizione dei bovini non permette di escludere una età di morte in qualche caso più avanzata del 3,5/5 che sembrano riscontrarsi, il dato più significativo è che, nonostante l'indubbio interesse verso l'alimentazione carnea, non venivano consumati nè vitelli nè animali d'età precedente ai 3/4 anni: perché?

Può essere la spia di un sistema produttivo misto in cui il bovino aveva, come in altri siti (quelli italiani, per esempio) una sua importanza nella produzione cerealicola?

Oppure era una scelta costretta dal "periodo d'ingrasso" dei bovini medievali, non dimenticando la loro mole ridotta?

---

[29] Lo studio di Villier-Le-Sec e il suo rapporto con Saint-Denis è oggetto della pubblicazione di *Un village au temps de Charlemagne...*, a cura di R. GUADAGNIN, Paris, 1988; lo studio dei resti faunistici è stato condotto da J.-H. Ivinec; quello dei dati antropologici da G. Aboire.

[30] *Un village...* 1988, 231.

[31] *Un village...* 1988, 234.

[32] Lo studio dei resti faunistici di La-Charitè-sur-Loire è stato condotto da Frederique Audoin-Rouzeau e pubblicato nel 1986.

[33] Audoin-Rouzeau 1986, 105.

Concentrando, per il momento, l'interesse sulla questione del "periodo d'ingrasso" va detto che quest'attenzione potrebbe essere stata una caratteristica comune (medievale, cioè finché non si diffonderà il consumo del vitelli, uno dei primi segnali di mutamento) a tutti i centri dove il bovino appare consumato in età maturo-adulta: il che potrebbe dimostrare che la scelta dello sfruttamento per la carne del bovino poteva essere ben chiara anche per le popolazioni rurali del medioevo italiano. Ancor di più, quindi, non si può parlare di animali macellati come "bestie inutili" nel caso di bovini che avevano superato l'età oggi comunemente considerata giusta per il consumo della came bovina.

La Francia medievale sembra insomma caratterizzata da un sistema alimentare meno uniforme rispetto a quello italiano. E questo probabilmente a causa del suo più elevato sviluppo aziendale già in età tardoantica, e/o per la maggiore robustezza del modello di consumo urbano in età altomedievale, e/o per una attività centralistica "nazionale"; diminuzione della mole dei bovini, maggiore lentezza nel periodo d'accrescimento (e d'ingrasso) sono comunque dati di fatto anche per questa area dell'Europa occidentale.

Le differenze tra Italia e Francia medievale sono però allo stesso modo profonde: sistemi di cottura e modelli alimentari molto simili (si pensi a modi di cottura e scelte alimento diffuse nel Forez bassomedievale, in tutto eguali rispetto alla Sicilia coeva[34]) si accompagnano a grandi differenze: un'azienda come quella legata a Saint-Denis non trova un parallelo (almeno per ora) in Italia, nemmeno in quella meridionale, che dovrebbe essere (secondo un'idea ormai superata) legata a modelli produttivi e alimentari ancora "tardoantichi".

In alcuni villaggi della Francia merovingia e carolingia i dati faunistici segnalano non solo l'importanza dei bovini (superiore a coevi villaggi dell'Italia meridionale, come S. Maria in Cività[35]: ma questo non può stupire, dopo quello che si è finora evidenziato) ma anche la compresenza di due diverse specie bovine (una piccola e una più grande): sono piccoli centri forse orientati all'autoconsumo, dove si attua però poca attività di caccia; dal che se non altro risulta difficile pensare che i gruppi etnici germanici abbiano diffuso un loro modello rurale e alimentare: è difficile per la Francia rurale merovingia, come lo è per l'Italia altomedievale, anche per quella "longobarda"[36].

Bisogna ora accennare ad un problema, solo per proporlo: come mai non si portò avanti una significativa selezione delle specie bovine in età medievale, così d'aumentarne la mole (o la produttività carnea, o lattiera)? bisogna considerare il gap tecnologico subito nelle tecniche agropastorali medievali rispetto all'età classica, e insieme la diffusione (sin dal VI-VII secolo) di razze bovine più piccole e più resistenti, che forse in una prima fase convissero con le altre (come si è appena visto); ma va sottolineato il fatto che la selezione si attua se finalizzata ad una specializzazione e soprattutto attraverso di essa. Che queste due condizioni si siano presentate in età medievale, a parte alcune aziende specializzate d'area francosettentrionale, è del tutto da dimostrare.

I tempi di crescita del bovino medievale potrebbero aver per primi contribuito ad uno scarso interesse alla sua selezione: se infatti l'età di "massimo ingrasso" non era troppo distante da quella di un suo utilizzo almeno per alcuni anni per il lavoro dei campi (o per la produzione lattiera) ecco che la coincisione di questi tre modelli di sfruttamento, vantaggiosi magari solo temporaneamente ma molto poco "costosi", poteva nel medioevo ben essere rappresentata da un'età di morte di 4/5 anni: a quell'età il bovino poteva garantire, con minimo sforzo da parte dei contadini, la riproduzione e lo svezzamento di 1 o 2 vitelli (ovviamente se femmina), almeno 3 anni di utilizzo come forza-lavoro e una notevole quantità di carne, di buona qualità se veniva bollita. Questa coincidenza di età sarebbe stata invece impossibile nei secoli precedenti (o moderni) quando età di macellazione (2/3 anni), di lavoro (10 anni e oltre), di latte (almeno 7/8 amu) dvvero non coincidevano.

3.2 Il consumo di latte vaccino in Francia: le conseguenze demografiche

Occorre ora affrontare la questione, finora solo accennata, della produzione e consumo di latte vaccino.

L'uso del burro come canone dell'abbazia di Saint-Denis testimonia l'importanza della mucca da latte, senza dubbio legata almeno in parte all'uso di questo grasso animale per l'alimentazione. Nell' ambiente mediterraneo, dove prevale l'uso dell'olio, questa importanza del latte vaccino è molto minore: in Italia il latte (di alcun animale) non risulta citato nei patti colonici e nei polittici[37].

---

[34] Sul Forez si veda: Bidou & Beck-Bossard 1984.

[35] Su Brebières e altri centri: Poulain-Josieu 1977; su S. Maria in Cività: Barker 1973.

[36] Sul non forte impatto del modello germanico nell'Italia medievale: Giovannini instampa (*L'impatto*...).

[37] Montanarì 1979, 250.

L'assenza del burro in Italia settentrionale e la sua solo recente adozione si spiegano con il fatto che la "divisione alimentare" nell'uso del grassi era (fino a poco tempo fa) tra lardo (Italia settentrionale) e olio (Italia centromeridionale)[38]. Molto probabilmente per la Francia centrosettentrionale (e non solo) si può parlare invece di "area del burro". L'impatto di questa scelta "gastronomico-alimentare' non può essere considerato secondario: non solo dal punto di vista della presenza numerica delle mucche (a questo proposito è illuminante il confronto tra i dati di Annapes e quelli di S. Giulia di Brescia[39]) e della loro elevata età di macellazione, ma anche riguardo all'alimentazione umana.

Se veramente questa disponibilità o preferenza verso il latte vaccino in Francia settentrionale fosse attestata, potrebbe aver avuto una qualche conseguenza sui tassi di natalità: più elevati per la diminuzione dell'intervallo da allattamento prolungato, visto che i bambini potevano in certi casi essere divezzati con latte vaccino[40]; questi tassi di natalità potrebbero aver portato però ad una più elevata mortalità sia degli infanti (per motivi batteriologici) che degli adulti, sopratutto dome (per motivi carenziali). Il che darebbe forse un tasso d'incremento demografico delle popolazioni rurali lento come o più di quello italiano, ma per ragioni opposte.

I dati antropologici provenienti dal villaggio di Villiers-le-Sec consentono in effetti di mettere in evidenza un elevato tasso di mortalità tra i 0-5 anni, che corrisponde, pur tenendo conto della problematica della sottorappresentazione delle sepolture infantili (che però rafforza e non indebolisce questa sensazione) alla condizione di altri centri della Francia altomedievale[41]. Un'ulteriore indicazime giunge dallo studio dell'ipoplasia dello smalto (tipico "stress nutrizionale") in sepolture altomedievali della Basilica di Saint-Denis; si tratta di individui provenienti dalla città, con una buona condizione generale (e un'età di morte abbastanza elevata) ma con stress nutrizionali tali da far immaginare uno svezzamento nettamente anticipato rispetto a quello diffuso, per esempio, nell'Italia coeva[42].

In via ipotetica si potrebbe affermare che in Francia, dove la specializzazione del bovino da lavoro e da latte sembra attestata, questa si inquadrò (permettendolo) in un sistema sociale e commerciale tale da comportare una diversificazione tra ambito rurale e urbano: ciò portò a tassi di natalità elevati (con altissima mortalità tra i 0-5 anni), difficilissime condizioni in ambito rurale, ma talvolta buone opportunità di vita nei centri urbani: la minore endogamia presente nei gruppi urbani dovette favorire, spinta dai forti tassi di natalità, un lento ma costante incremento demografico, proveniente però sopratutto da questo ambito "meno rurale".

In Italia, dove il mondo e i ritmi rurali a sfondo silvopastorale sembrano aver preso un netto sopravvento già dal VI secolo, si riscontra spesso una dieta alimentare più equilibrata tra carne e cereali, con buone condizioni ossee, ma insieme ad un non elevatissimo tasso di natalità, si trova una frequente vulnerabilità "biologica" (derivante almeno in parte dalla diffusione dell'endogamia) degli abitanti dei piccoli centri ruralì ad epidemie provenienti al di fuori del gruppo. Questa situazione si rispecchia nella "multifunzionalità" del bovino nell'Italia medievale e potrebbe forse contribuire a spiegare il lentissimo incremento demografico, a fronte di buone condizioni alimentari e fisiche, dell'Italla fmo all'epoca bassomedievale[43].

3.3 Alcuni dati sul bovino in Inghilterra

Solo per citare alcuni dati faunistici provenienti dall'Inghilterra, l'importanza del bovino è evidente anche nel medioevo inglese. I bovini sono in genere percentualmente numerosi (quasi il 30% nell'Okehampton Castle di prima del 1300, più del 30% tra il 1000 e il 1400 ad Exeter)[44]; dal punto di vista della quantità di carne, l'importanza del bovino è netta; e

[38] Montanari 1979, 394-395.

[39] Montanari 1979, 224: Santa Giulia in Brescia: monastero che aveva proprietà disseminate nell'Italia settentrionale, soprattutto in Lombardia. Il 9,4% di bovini di cui si parla a S. Giulia sono 351 capi: di questi i buoi sono 270, le vacche sono 46, i vitelli/giovenchi sono 35. Nell'inventario di Annapes il rapporto mucche/buoi è sostanzialmente paritario.

[40] Va comunque detto che la lattazione prolungata è nota anche per la Francia altomedievale, almeno rurale; ma solo una buona disponibilità alimentare (soprattutto di carne rossa) consente di fornire latte nutriente a lungo; si veda: *De virtutibus s. Martni,* liber III, 51 (*"de infantulo sanato")* in M.G.H., Script. rer. merov., I, Gregorii Turonensis opera, ed. W. ARNDT & Br. KRUSCH, Hannover, 1885, 644.

[41] I dati antropologici di Villiers-Le-Sec sono studiati da Guy Abuire in *Un Village...* 1988, 180-183. Sempre qui si vedano i dati sull'alta mortalità tra i 0-5 ami, oltre che di Villiers-Le-Sec (VIII-X), di Cherbourg (IX-XI), Verson (VI-VIII) e Epone (VI-VIII).

[42] Si veda la rilevanza dell'ipoplasia dello smalto tra i 18 mesi-2 anni, in Gallien 1994; per il confronto: Giovannini in stampa (*Funzioni...*).

[43] Anche le fonti storiche sembrano talvolta segnalare per alcune aree italiane, in fasi di espansione rurale, una bassa natalità: per esempio si veda il caso di abruzzesi di VII-IX secolo con 2,3 figli per coppia: in Feller 1994.

[44] Si vedano i dati di M. Maltby n'portati da Audoin-Rozeau 1993, 283-285.

ciò nonostante il bovino britannico medievale sia particolarmente piccolo; la sua importanza alimentare è centrale, visto che la caccia e la pesca sembrano giocare m ruolo molto secondario; l'età di macellazione che si riscontra nei centri urbani indica animali frequentemente macellati tra i 4 e gli 8 anni; solo con la fine del medioevo, come succede un po' in tutta Europa, il vitello fa il suo massiccio ingresso nei consumi urbani[45]. Si tratta di un'età di macellazione che appare abbastanza atipica, comunque differente da quella francese; forse in parte simile a quella italiana, che potrebbe far pensare, in tutt'altra situazione socio-economica, ad un forte orientamento rurale.

Nell'Inghilterra bassomedievale (come nella Francia altomedievale) esistevano diverse specie bovine: nella Londra bassomedievale accanto a bovini dalle lunghe corna di grande mole (circa 150 cm. di altezza al garrese) esistevano animali a corna piccole, che erano sempre stati tipici dell'Inghilterra medievale (110 cm.)[46]; come attestano una serie di studi[47] in Inghilterra il mutamento prerinascimentale sembra aver ruotato con particolare forza attorno alla diffusione di una nuova razza bovina di grande mole e forse buona produttività lattiera (visto il grande aumento nel consumo di vitelli).

4 Verso il rinascimento, il ritorno ai "tre" bovini...

Il mutamento nelle forme da cucina, nella condizione antropologica e in quella faunistica dei siti archeologici tra fasi medievali e fasi rinascimentali è abbastanza evidente: in Italia non solo si fanno largo nuove forme di ceramica da fuoco, per esempio i tegami, che rispecchiano una cucina che utilizza i fritti e gli umidi, interrompendo cosi il "monopolio del bollito"[48], ma si assiste allo sviluppo del pane, cui fa riscontro un uso sempre più marginale della focaccia o del pane "duro" cotto con il testello e il testo da pane[49], prima molto diffusa in ambito mediterraneo. Questo mutamento riflette un adeguamento ad un modello più urbano, che pone un termine all'adozione di un modello "rurale" alimentare che si era diffuso anche nei centri urbani, soprattuto in Italia.

In questo quadro, anche l'allevamento del bovino torna a divaricarsi in vere e proprie specializzazioni: nelle fasi rinascimentali si ritrova quella divisione tra bovino da carne, da latte e da lavoro, come età di macellazione che corrisponde cronologicamente alla vastissima diffusione del pane come alimento base nelle popolazioni rinascimentali e moderne[50]. Allo stesso modo, le fasi postmedievali di siti archeologici che avevano restituito resti faunistici bovini coerenti con il suo utilizzo d'età medievale, iniziano a segnalare la 'divaricazione" tra bovini da carne, con la talvolta massiccia comparsa del vitello, prima molto raro, e con bestie soppresse in età non più "maturo-adulta", quanto "adulto-senile".

Esistono quindi una serie di indicatori legati al mondo dell'alimentazione che mostrano il passaggio ad un nuovo regime economico-sociale, in cui un "modello commerciale" (o se si preferisce "urbano") riprende il sopravvento. Laddove esisteva un forte carattere agro-pastorale nell'allevamento bovino, mutando questo si trasforma anche il modello alimentare delle popolazioni, che sembra risentire di una consistente diminuzione del livello di alimentazione carnea. Questo quadro, molto evidente per l'Italia, accomuna l'intera area dell'Europa occidentale, accompagnando i grandi mutamenti dell'Europa pre-rinascimentale.

Conclusioni

Bìsogna ribadire che le difficoltà nell'individuazione dell'età di morte degli animali, sia per la frammentarietà dei resti osteologici, che per la loro conservazione, pone un grosso interrogativo sulla validità oggettiva delle ipotesi che si possono formulare.

Nonostante questo notevole ostacolo, sembra peraltro necessario, quando possibile, tentare comunque di integrare i dati faunistici con gli altri dati, in primo luogo quelli antropologici e quelli sulle ceramiche da fuoco, disponibili ormai da molti siti archeologici.

E' così forse possibile, grazie soprattutto ai confronti con le epoche precedenti e successive, mettere in luce la "diversità" del bovino in età medievale, la sua indubbia centralità e il suo con-

[45] O'Connor 1989.

[46] Sulle due razze bovine presenti nella Londra bassomedievale: Armitage 1982.

[47] Si vedano in Armitage 1982 le altezze dei bovini inglesi dal periodo classico all'età moderna.

[48] Quella di "monopolio del bollito" è una definizione di C. Beck-Bossard (1981).

[49] La focaccia resta, ma sempre più marginale, così da diminuire la sua complementarità col brodo carneo.

[50] Sulla diffusione del pane nell'Italia postmedievale si vedano i lavori di M. Montanari (1979).

tributo fundamentale alla sopravvivenza spesso difficile delle popolazioni medievali europee. E ciò grazie sopratutto alla sua resistenza fisica, alla vitalità "biologica" della specie e alla sua protostorica multivalenza, sfruttata in modo diverso a seconda del clima, delle razze diffuse e delle necessità dell'uomo.

Bibliografia

ARMITAGE P. 1982: Developments in british cattle husbandry, *the Ark* IX, 2, 50-54.

AUDOIN-ROUZEAU F. 1986: *Ossements animaux du Moyen Age au monastère de La-Charitè-Sur-Loire,* Paris.

AUDOIN-ROUZEAU F. 1993: *Hommes et animaux en Europe de l'époque antique aux temps modernes. Corpus de données archéozoologiques et historiques,* Paris.

BARKER G. 1973: The economy of medieval Tuscania: the archaeological evidence, *Papers of the British School at Rome* XXXI, 155-177.

BARKER G. & A. WHEELER 1978: Informazioni sull'economia medievale e postmedievale di Pavia: le ossa dello scavo, *Archeologia Medievale* V, 249-266.

BARNISH S.J.B. 1987: Pigs, plebeians and potentes: Rome's economic hinterland, c. 350-600 AD, *Papers of the British School at Rome* LV, 157-185.

BARTOLI F. 1992: Indagini paleonutrizionali sul campione di età Arabo-normanna e sveva della necropoli di Caliata presso Montevago (AG), in: *Atti del Convegno Nazionale. Dagli scavi di Montevago alla Rocca d'Entella: un contributo alla storia dei musulmani della Valle del Belice dal X al XIII secolo (Ott. 1990)*, Agrigento, 257-264.

BECK-BOSSARD C. 1981: L'alimentanone di un villaggio siciliano sulla scorta delle fonti archeologiche, *Archeologia Medievale* VIII, 311-320.

BEDINI E. 1990: I reperti faunistici della Rocca d'Asolo (campagna di scavo 1987). Nota preliminare, *Archeologia Medievale* XVII, 331-346.

BIDOU D.A. & C. BECK-BOSSARD 1984: La préparation des repas et leur consommation en Forez au XV siècle d'apres les sources archéologiques, in: *Actes du Colloque de Nice (oct. 1982). Manger et boire au Moyen Age*, Paris, II, 59-71.

BOKONYI S. 1984: *Animal husbandry and hunting in Tac-Gorsium. The vertebrate fauna of a roman town in Pannonia,* Budapest.

Brucato. Histoire et archéologie d'un habitat médiéval en Sicilie, a cura di J.-M. PESEZ, Collection de l'Ecole Française de Rome 78, Rome, 1984.

CLARK G. 1984: Il Castello di Ponte Nepesino. La fauna (V), *Archeologia Medievale* XI, 127-147.

COMET J. 1992: *Le paysan et son outil,* Rome.

CRAM C.L. 1967: Reports on the Animal bones from Hockwold, *Proceedings of The Cambridge Antiquarian Society* LX, 75-80.

Crypta Balbi, L'esedra della Crypta Balbi nel medio evo (XI-XV secolo), Archeologia urbana a Roma: il progetto della Crypta Balbi 5, a cura di L. SAGUÌ & L. PAROLI, Firenze, 1990.

DUBY G. 1966: Le problème des techniques agricoles, in: *Settimana di Studio del Centro italiano di studi sull'Alto Medioevo XIII (Apr. 1965). Agricoltura e Mondo Rurale in Occidente nell'Alto Medioevo*, Spoleto, 267-293.

DUBY G. 1972: *L'Economia rurale nell'Europa Medievale,* Bari (Paris, 1962).

La Fame nella storia (a cura di R.I. ROTBERG & T.K. RABB), Roma, 1987 (Cambridge, 1985).

FARELLO P. 1990: Contesti tardoantichi e altomedievali dal sito di Villa Clelia (Imola). Reperti faunistici, *Archeologia Medievale* XVII, 130-134 e 208-215.

FELLER L. 1994: La population abruzzaise durant le haut Moyen Age: les conditions de possibilité d'une croissance démographique (VIIIe-IXe siècles), in: *Demografia e Società nell'Italia Medievale, secoli IX-XIV*, a cura di R. COMBA & I. NASO), Cuneo, 327-350.

FERRO A.M. 1991: L'insediamento romano e altomedievale di San Michele a Trino (Vercelli). La fauna, *Archeologia Medievale* XVIII, 412-415.

FORNACIARI G. & F. MALLEGNI 1987: Indagini paleonutrizionali su campioni di popolazioni di età imperiale romana, in: *L'alimentazione nel mondo antico. I romani, l'età imperiale*, Roma, 63-68.

FORNACIARI G. 1980: Considerazioni antropologiche e paleopatologiche sugli inumati del "chiostro piccolo" di Santa Maria all'Impruneta (Firenze, metà-2a metà sec. XV), *Quaderni di Scienze Antropologiche* 4, 78-93.

FornaCiari G., E. TREVISANI & B. CECCANTI 1984: Indagini paleonutrizionali e determinazione del piombo osseo mediante spettroscopia ad assorbimento atomico sui resti scheletrici di epoca tardoromana (IV sec. dC) della "Villa dei Gordiani" (Roma), *Archivio per l'Antropologia e l'Etnologia* CXIV, 149-176.

FUMAGALLI V. 1976: *Terra e Società nell'Italia Padana. I secoli IX e X,* Torino.

GALLIEN V. 1994: La femme: témoin de l'évolution du cimetière de la basilique, à Saint-Denis, in: *La femme pendant le moyen âge et l'époque moderne*, sous la direct. de L. BUCHET), Paris, 69-86.

GIOVANNINI F. in stampa: Funzioni delle forme ceramiche e modelli alimentari medievali, in: *Atti del III Convegno di studi sulle ceramiche di età medievale e modema a Roma e nel Lazio, Roma 12-13 apr. 1996.*

GIOVANNINI F. in stampa: L'impatto del modello germanico di organizzazione rurale e di alimentazione sulle popolazioni italiche e galloromane a seguito delle invasioni di V-VI secolo, in *Atti del XIII Congresso UISPP, Sez. 13 - Epoca romana, Forli 8-14 sett. 1996*, in stampa.

HIGHAM C. & M.A MESSAGE 1969: An assessment of a prehistoric technique of bovine husbandry, in: D. BROTHWELL & E.S. HIGGS, *Science in Archaeology,* London.

HODGES R., G. BARKER & K. WADE 1980: Excavations at D85 (santa Maria in Cività): an early medieval hilltop settlement in Molise, *Papers of the British School at Rome* 35, 70-124.

KING A.C. 1987: Dallo scavo a Villa Maria di Lomello (Pavia), 1984; la buca tardoantica 203. Ossa animali, *Archeologia Medievale* XIV, 175-176.

JOURDAN L. 1976: *La faune du site gallo-romain et paleochrétien de La-Bourse (Marseille),* Paris.

LEPETZ S., P. MÉNIEL & J.-H. YVINEC 1995: Archéozoologie des installations rurales de la fin de l'Age du Fer au début du Moyen Age, in: Histoire et Sociétés rurales 3, 169-182.

LUFF M.R. 1982: *A zooarchaeological study of the roman north-western provinces,* BAR International Series 137.

MONTANARI M. 1979: *L'alimentazione contadina nell'alto medioevo,* Napoli.

MONTANARI M. 1993: *La fame e l'abbondanza. Storia dell'alimentazione in Europa,* Bari.

La nécropole de Saint-Martin-de-Fontenay (Calvados). Recherches sur le peuplement de la plaine de Caen du Ve s. avant J.-C. au VIIe s. après J - C., sous la direction de C. PILET, 54e suppl. à Gallia, Paris.

O'CONNOR T. 1989: What shall we have for dinner? Food remains from urban sites, in: D. SERJEANTSON & T. WALDRON (eds), *Diet and Crafts in towns - the evidence of animal remains from the Roman to the Post-medieval periods*, BAR British Series 199, 13-23.

POULAIN-JOSIEU T. 1977: Etude de la faune, in: P. DEMOLON, *Le village mérovìngien de Brebières (VIe-VIIe siècles)*, Arras, 251-338.

RAEPSAET G. 1995: Les premiers de la mécanisation agricole entre Seine et Rhin de l'Antiquité au 13e siècle, *Annales: histoire, sciences sociales* 50, n. 4, 911-942.

RIEDEL A. 1986: Ergebnisse von archeozoologischen Untersuchungen im Raum zwischen Adriakuste und Alpenhauptkamm (Spätneolithikum bis zum Mittelalter), *Padusa* XXII, nn. 1-2-3-4, 1-220.

SALZA PRINA RICOTTI E. 1987: Alimentazione, cibi, tavola e cucine nell'età imperiale, in: *L'alimentazione nel mondo antico. I romani, l'età imperiale*, Roma, 71-130.

SHERRATT A. 1981: Plough and pastoralism: aspects of the secondary products revolution, in: I. HODDER *et al.* (ed.), *Pattern of the past, Studies in honour of David Clarke*, Cambridge, 261-306.

SENA CHIESA G. & B. WILKENS 1990: I resti faunistici di Calvatone (CR), *Archeologia Medievale* XVII, 307-322.

STOUFF L. 1969: La viande. Ravitaillement et consommation à Carpentras au XVe siècle, *Annales Economie, Société, Civilisation* 24, n. 6, 1431-1448.

TANNAHILL R. 1985: *Storia dei costumi sessuali*, Milano (ed. or. *Sex in History*, 1980).

TOZZI C. 1981: L'alimentazione nella Maremma medievale. Due esempi di scavi, *Archeologia Medievale* VIII, 299-303.

Un village au temps de Charlemagne. Moines et paysans de l'Abbaye de Saint-Denis du VII siècle à l'An Mil, a cura di R. GUADAGNIN), Paris, 1988.

VILLARI P. 1988: Resti faunistici da uno scarico medievale del castello di Fiumedenisi (Messina), *Archeologia Medievale* XV, 609-642.

Dr. Fabio Giovannini
Università di Roma "La Sapienza"
Via Sessoriana 1
00185 Roma
Italia

Marta Moreno García

The zooarchaeological evidence for transhumance in Medieval Spain

I Introduction

The practice of transhumance in the Mediterranean world has been explained in historical and geographical terms as the complementarity of mountain and plain. Thus the seasonal movement of herdsmen and their animals between summer and winter pastures was determined by the environmental conditions of the area (Vidal de la Blache 1926). The same approach was taken when studying livestock farming in the ancient world. For Semple: "stock-raising in the ancient Mediterranean world bore the unmistakable impress of its environment. It was conditioned primarily by summer drought" (Semple 1922, 4). Some authors such as Fribourg (1910) however took a wider view and noted how together with environmental conditions specific social circumstances were necessary for transhumance to develop. More recent work (Baticle 1974; Delano Smith 1979) has taken up this line of research and moved away from the deterministic traditional environmental approach of French human geographers.

Yet the archaeological evidence for transhumance has been based mainly on analogies with historical and recent specialised economies of the Mediterranean (Halstead 1987a). Thus the same seasonal environmental constraints noted in the geographical literature have been transposed to the past in order to explain the human presence in the Mediterranean uplands and sometimes in the lowlands (Halstead 1990, 61). Little concern has been shown to assess the particular social and economic circumstances surrounding these traditional societies. This has been the case with the large scale transhumant sheep movements in medieval Spain with the Mesta or the Dogana in Italy. They have provided a source of information for the transhumance specialised husbandry practice, which has been extrapolated into prehistoric times, without considering the historical background of these state-controlled systems (Lewthwaite 1981; Walker 1983).

Recently, the development of ethnographic work among traditional pastoral communities in the Mediterranean has proved to be of great interest to evaluate and assess the varied environmental, social and economic circumstances under which the phenomenon of transhumance takes place. Some well known examples are the case studies of Lewthwaite (1981) in Corsica and Sardinia; Chang (1984) in Greece; Cleary (1986,1988) in Languedoc; Barker (1990) in Italy and Halstead (1990) in north west Greece. The data derived from the observation of traditional societies may be used then not as an analogy but as a guide to the questions we should be asking about the past (Halstead 1987a, 77).

The study of the archaeological evidence for pastoralism in the Iberian Peninsula has been considered only for prehistoric times in the light of the medieval large-scale movements of sheep. An illustrative example was the attempt of Higgs (1976) to associate the distribution of Spanish megalithic tombs with the routes followed by the medieval shepherds of the Mesta. Higgs plotted the dolmens against a map of the drovers' roads ('cañadas') and related the location of the megaliths to prehistoric patterns of pastoral movements. Later, Chapman (1979) argued it was more a visual effect and that there was no real archaeological evidence to support the idea of such large-scale movements of livestock in prehistoric times. If any occurred, they would have been on an altogether smaller scale, both in terms of flocks and regular distance covered between pastures, than many of their medieval and modern counterparts.

It appears there has been a great concern in detecting the origins of specialised pastoralism in the prehistoric Mediterranean but not much work has been done with the archaeological evidence recovered from medieval sites where transhumance, according to the documentary sources, was practised. The obvious archaeological data with which to contrast the written records would be faunal remains. As far as Spain is concerned the reasons this sort of research has not been carried out are twofold. On the one hand, animal remains are still unrecognised as tools of prime relevance in Spanish Medieval Archaeology, and on the other hand, an important

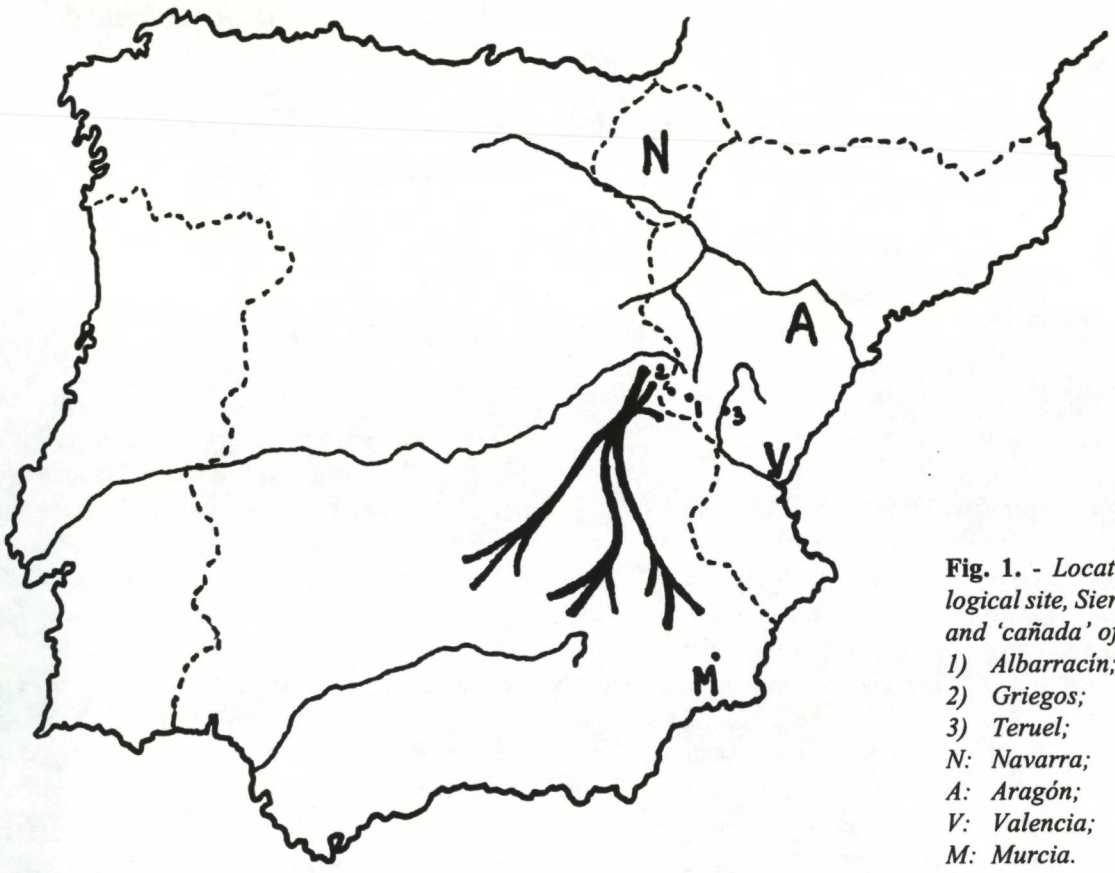

Fig. 1. - *Location of archaeological site, Sierra of Albarracín and 'cañada' of Cuenca.*
1) Albarracín;
2) Griegos;
3) Teruel;
N: Navarra;
A: Aragón;
V: Valencia;
M: Murcia.

number of Iberian medieval faunal assemblages remains unpublished (Morales 1996).

This paper is an attempt to show the potential of zooarchaeology in providing a corpus of data against which the historical evidence under which transhumance developed in Medieval Spain can be evaluated and contrasted with.

II Material and methods

II.a The archaeological site of Castillo de Albarracín, Albarracín, Teruel (Spain)

The site of Albarracín lies on the Sierra of the same name at 1195 m a.s.l., in the upper western part of the province of Teruel, Community of Aragón (Fig. 1). The Sierra stands in the southern part of the Iberian range. The average height is 1200 m a.s.l., with some villages among the highest in Spain, i.e. Griegos at 1602 m a.s.l and Guadalaviar at 1519 m a.s.l. There is a high mountain climate with cold temperatures (annual mean between 9°C and 11°C) and abundant rain (especially on the NW side with more than 600 mm per year), short and very dry summers. The rich forests of *Pinus sylvestris* L. in the Sierra keep an important surface of very good quality pastures.

The faunal remains on which my research is based were recovered in the excavations of the Castillo de Albarracín, carried out in 1992 and 1994 by a team of archaeologists from the *Centro de Estudios Turolenses* of the *Colegio Universitario of Teruel*. All the material is hand-collected since no sieving program was designed for the excavation. The animal remains were sent to the Archaeozoology Lab. of the *Universidad Autónoma* of Madrid where I carried out most of the identifications. The bulk of the material was collected from two dumps located inside the enclosure of the castle. The main periods of occupation of the site are summarised in the following brief historical account.

II.b The historical written sources

The main historical reference for medieval Albarracín is the series published by the *Instituto de Estudios Turolenses*, directed by Professor Almagro on the History of Albarracín and its Sierra (Almagro 1959; 1964). This work provides an interesting historical background in which our archaeological data can be placed.

Bosch Vilá (1959), in volume 2 of this series, summarises the history of Islamic Albarracín. After the conquest of the Iberian Peninsula by the Moors,

Table 1
Mean relative percentage contribution of mammalian bones per taxa per period to the assemblage, based on diagnostic zones.

TAXA %	Period 1 %	Period 2 %	Period 3 %	Period 4 %	Period 5
Domestic mammals					
Horse *(Equus caballus)*	<1.0	1.0	6.1	13.7	8.8
Ass *(Equus assinus)*	-	<1.0	1.0	2.0	4.1
Cattle *(Bos taurus)*	2.3	6.0	4.1	14.1	14.6
Sheep *(Ovis aries)*	33.0	37.2	26.6	20.9	25.8
Goat *(Capra hircus)*	3.4	7.1	1.2	3.0	1.2
Sheep/Goat *(Ovis/Capra)*	43.1	30.0	23.2	26.3	24.8
Pig (Sus dom.)	<1.0	2.1	<1.0	6.4	8.0
Dog *(Canis familiaris)*	<1.0	-	<1.0	<1.0	-
Cat *(Felis catus)*	<1.0	-	<1.0	<1.0	-
Total domestic mammals	**83.0**	**84.2**	**62.7**	**87.6**	**87.3**
Wild mammals					
Red deer *(Cervus elaphus)*	1.5	2.2	<1.0	7.3	9.3
Roe deer *(Capreolus capreolus)*	<1.0	<1.0	-	-	-
Hare *(Lepus* sp*)*	4.7	1.3	<1.0	<1.0	-
Rabbit *(Oryctolagus cuniculus)*	10.7	12.0	35.6	4.8	3.3
Badger *(Meles meles)*	-	-	<1.0	-	-
Wolf *(Canis lupus)*	-	-	-	-	<1.0
Fox *(Vulpes vulpes)*	-	-	<1.0	-	-
Total wild mammals	**17.0**	**15.8**	**37.3**	**12.4**	**12.7**

the country was divided in different territories, probably following the ecclesiastical divisions of the Visigoths. The medina (city) of Albarracín was part of the Kura of Santaver. According to Aben Hayyán (11th century, quoted by Bosch Vilá 1959), one of the few Arab authors who mentions Albarracín, this territory was part of the frontier in the 11th century. Before that date, there are hardly any records of Albarracín either in the Islamic or in the Christian sources. The city flourished at the time of the first Taifa Kingdoms, after the dismemberment of the Caliphate of Córdoba (1010-3), under the family of the Beni Razín. Hudail (1013-1045) is the first ruler, the second is Abd-al-Mealik (1046-1103) and the third and last is Yahía (1103-1104). It is under the government of the second of these kings (period 1) that Albarracín became an important centre, both strategically and economically speaking, of eastern Al-Andalus. The court stayed until the first years of the 12th century, when the Almoravids took Valencia (1102). In 1104, the Almoravid governor of Valencia deposed Yahía. It is assumed that the court was dismantled and that only a small garrison troop was left in the Castillo de Albarracín to defend the territory. The period from 1104 to 1145 (period 2) has been defined by Bosch Vilá (1959) as the dark years of Albarracín. It is not mentioned in the sources until 1147 when the Almoravids are expelled from Valencia and all the eastern part of Al-Andalus becomes a new Taifa kingdom under the king of Murcia, in which Albarracín is included (period 3). In 1170, due to military alliances between this king and the kings of Navarra, the land of Albarracín is offered to a Christian lord from this kingdom, don Pedro Ruiz de Azagra, preventing this territory from falling into the hands of the Almohads (Almagro 1959). From this moment Albarracín will be an independent Christian kingdom (Señorío), between the Crowns of Aragón and Castilla (period 4). In 1284, Pedro III king of Aragón besieges the city of Albarracín for nearly one year and gives it to his son don Fernando. Although the independence of the Señorío of Albarracín finished then, its strategic location will make it play an important role in the political and economic relations between Aragón and Castilla (period 5; Almagro 1964).

II.c The faunal remains

Animal bone remains have been recovered from each of the chronological periods described, from mid 11th to mid 14th centuries. Although ovicaprine remains constitute the most abundant taxa for all periods, their relative contribution to the total assemblage seems to fluctuate over time (Table 1). Their role, first in the Islamic and later in the Christian communities, will be assessed through the variations in the mortality profile and sex ratio of the archaeological sample. The age at death was carried out through two methods: mandibular teeth eruption and wear stages, after Payne's (1973) and Silver's (1969) epiphyseal fusion data. The sexing followed the morphological variations noted by Boessneck (1969).

Grant (1990, 17) notes that: "when studying seasonality or seasonal indicators one must be aware of the fact that a single group may husband their different livestock in different ways; one species may be kept all the year around in or near the village and stall fed when necessary, while another species is herded up and down from plain to mountain on a daily or yearly cycle". Therefore, the occurrence of certain species and a particular kill-off pattern associated with one taxa cannot be taken as evidence of specialised pastoralism or any other seasonal activity on a site. Evaluating the preliminary results of our analysis in an historical context will provide a broader approach.

III Results

As Table 1 shows the bones of sheep and ovicaprids, of which the majority belong quite probably to sheep, are alternatively the most common in the assemblage for all periods, except for period 3 where rabbit is the dominant species. A possible explanation that could account for this will be put forward in the discussion.

In addition, the weight of domestic species against wild animals is evident. If the former are considered alone, the dominance of ovicaprids is outstanding for the first three periods; that is, the Islamic phase (Table 2). Dog, cat and ass have been left out since they were not probably considered as food animals. Horse is included for the butchery displayed in the bones points to the human consumption of this species, especially in periods 3 and 4. Thus, whereas most of the meat consumed at the site during the Islamic phase came from ovicaprids and, particularly from sheep, the Christian presence is attested by an increase in the consumption of beef, pork and deer. Undoubtedly, varied factors such as preservation and recovery are affecting these percentages. It must be pointed out that the lack of sieving must have reduced the sample size of the smaller species in relation to the larger ones. A considerable bias must be expected against recovery of small bone fragments of small-, medium size species, young age groups and small body parts. Notwithstanding, an interesting change in the meat consumption pattern of the inhabitants of the site is evident. If the low occurrence of pig in the Islamic phase can be interpreted as a consequence of their religious practices, the same reason cannot account for the nearly exclusive consumption of lamb and mutton and the low contribution of the other mammal species at this moment. The prevalence of ovicaprids is more probably related to the exercise of a different exploitation strategy from that practised later by the Christians.

The results of the state of eruption and wear of mandibular cheek teeth for ovicaprids are shown in

Table 2
Mean relative percentage contribution of main domestic mammalian bones per taxa per period to the assemblage, based on diagnostic zones.

TAXA %	Period 1 %	Period 2 %	Period 3 %	Period 4 %	Period 5
Domestic mammals					
Horse *(Equus caballus)*	<1.0	1.0	10.0	16.0	*10.5*
Cattle *(Bos taurus)*	3.0	7.0	7.0	17.0	17.5
Pig *(Sus* dom.)	<1.0	2.5	<1.0	7.5	10.0
Sheep *(Ovis aries)*	40.0	45.0	43.0	25.0	31.0
Goat *(Capra hircus)*	4.0	8.5	2.0	3.5	1.0
Sheep/Goat *(Ovis/Capra)*	52.0	36.0	37.0	31.0	30.0
Sheep+goat+ovicaprid	**96.0**	**89.5**	**82.0**	**59.5**	**62.0**
Total domestic mammals	100.0	100.0	100.0	100.0	100.0

Fig. 2. - *Ovicaprid mortality kill-off pattern and age survival curve (after Payne 1973).*

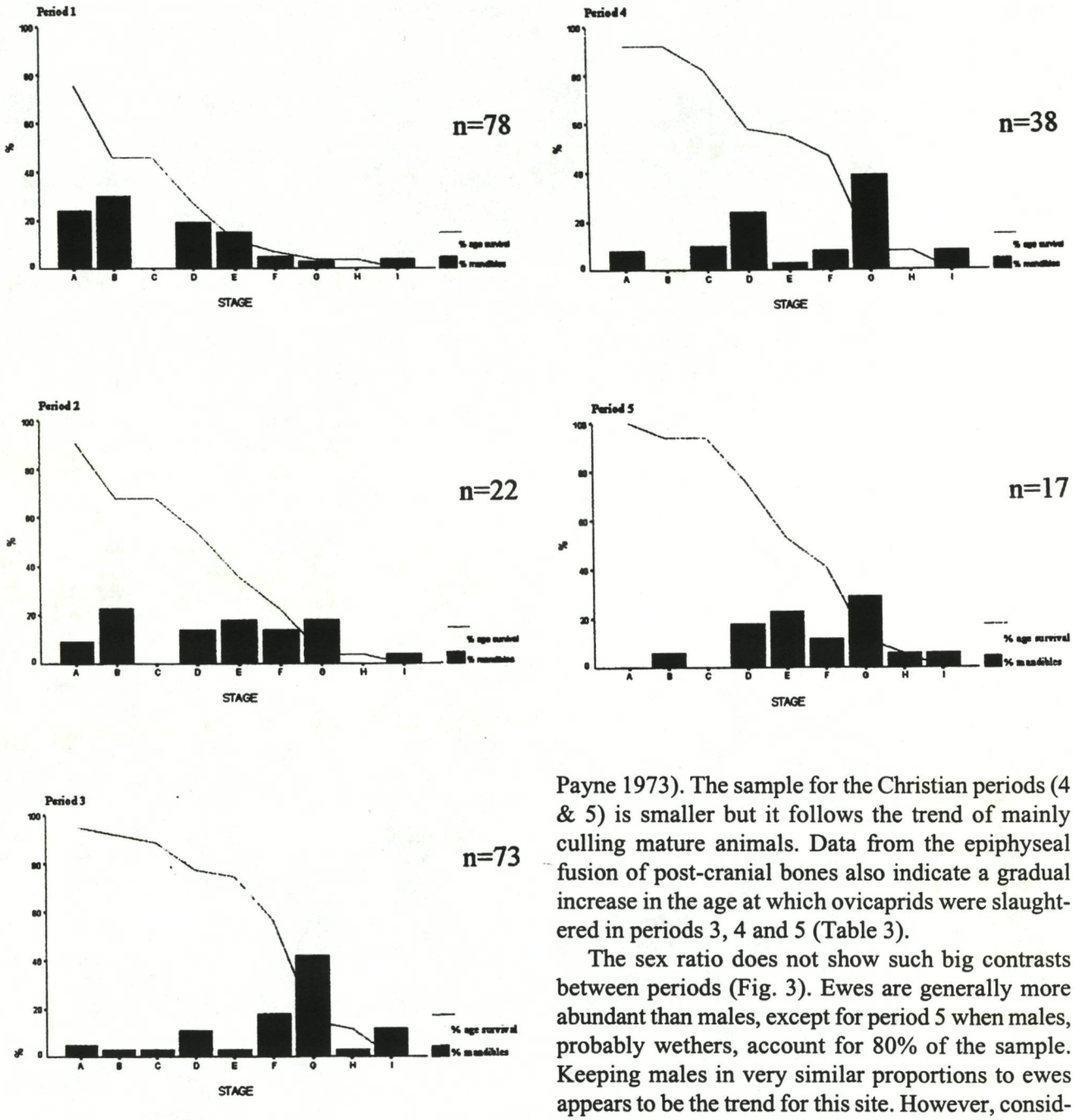

Fig. 2. The change in the age at death among the samples from period 1 and 2, in relation to the other three later periods is obvious. More than 50% of the ovicaprids in period 1 were of less than 6 months of age. Although the sample is much smaller and there is a slight increase towards older individuals, the same trend is apparent in period 2. Taking into account the lack of sieving, these percentages are probably biased against the young individuals. That is to say, an even bigger presence of immature animals would be expected. A radical change is observed during the second Taifa kingdom (period 3) with a peak of slaughter at 4-6 years of age (stage G, after Payne 1973). The sample for the Christian periods (4 & 5) is smaller but it follows the trend of mainly culling mature animals. Data from the epiphyseal fusion of post-cranial bones also indicate a gradual increase in the age at which ovicaprids were slaughtered in periods 3, 4 and 5 (Table 3).

The sex ratio does not show such big contrasts between periods (Fig. 3). Ewes are generally more abundant than males, except for period 5 when males, probably wethers, account for 80% of the sample. Keeping males in very similar proportions to ewes appears to be the trend for this site. However, considering together the kill-off pattern and the sex ratio in each period, one could argue ovicaprids were valued for different products/uses within time.

IV Discussion

Payne (1973), in his idealised model of the exploitation of ovicaprids for milk, records a high mortality pattern of mainly males and the keeping of old females, both to ensure milk production and flock reproduction. The kill-off pattern of such young individuals of less than 6 months of age for periods 1 and 2 in Castillo de Albarracín, could be an indication of the exploitation of the flock for their milk.

Table 3
Epiphyseal fusion data for *Ovis aries, Capra hircus* and *Ovis/Capra* (after Silver 1969).

BONE	Period 1 UNF. NISP	Period 1 FUS. NISP	Period 1 FUS. %	Period 2 UNF. NISP	Period 2 FUS. NISP	Period 2 FUS. %	Period 3 UNF. NISP	Period 3 FUS. NISP	Period 3 FUS. %
Fusion before birth									
Proximal metacarpus	22	37		3	9		5	78	
Distal first phalanx	-	74		-	11		-	151	
Distal second phalanx	-	29		-	5		-	33	
Proximal metatarsus	19	34		1	9		6	60	
Total	41	204	**83**	4	34	**89**	11	322	**97**
Early fusion (birth - 1.5 yrs)									
Distal scapula	50	87		14	16		9	56	
Distal humerus	85	122		14	31		14	65	
Proximal radius	59	103		7	14		11	36	
Proximal first phalanx	33	68		1	10		7	144	
Proximal second phalanx	2	27		-	5		-	34	
Total	229	407	**64**	36	76	**68**	41	335	**89**
Middle fusion (1.5 - 2.5 yrs)									
Distal tibia	68	80		12	20		13	35	
Distal metacarpus	50	10		5	5		12	44	
Distal metatarsus	24	19		2	2		11	19	
Distal metapodia	18	2		-	2		9	12	
Total	160	111	**41**	19	29	**60**	45	110	**71**
Late fusion (2.5 - 3.5 yrs)									
Proximal ulna	53	16		3	3		6	17	
Distal ulna	-	-		-	1		-	-	
Proximal femur	78	27		11	2		18	25	
Calcaneus tuber	47	30		3	6		11	22	
Distal radius	98	37		16	3		29	16	
Proximal humerus	72	16		11	-		22	12	
Distal femur	67	20		5	-		23	15	
Proximal tibia	88	7		16	2		28	5	
Total	503	153	**23**	65	17	**21**	137	112	**45**

However, no very old animals seem to have been kept, at all. Given the expected 'high status' of the court of the Beni Razín, one could argue the age profile does not reflect management strategy but consumption habits. Animals could have been introduced into the site as death carcasses or just to be slaughtered. Yet the occurrence of foetal and newborns of less than 2 months indicate the presence of breeding females on site. In addition, males and females seem to have been kept to an adult stage in similar proportions (Fig. 3) and there is no significant bias towards a particular cut of meat. The picture that begins to emerge from these data suggests ovicaprids were valued mainly for their meat, although undoubtedly milk, wool and manure would be other useful products.

During the ethnographic work we have carried out (Moreno García, forthcoming) in the Sierra of Albarracín, our informants told us how hard and expensive it was to keep a flock of sheep during winter. The pastures are frozen and animals have to be stall fed on fodder. Preference, by means of additional portions, is given to ewes with lambs.

The fact that a similar proportion of male and female animals were allowed to live in periods 1 and 2 suggests that the number of heads in the flock was not extremely high and that it was not a specialised economy orientated towards a market, with a strong emphasis on a certain product. It is likely though that the slaughtering of lambs between 2 and 6 months reflects the high status consumption pattern of the

Period 4			Period 5		
UNF. NISP	FUS. NISP	FUS. %	UNF. NISP	FUS. NISP	FUS. %
1	38		-	8	
-	27		-	6	
-	7		-	-	
2	42		1	14	
3	114	97	1	28	97
-	43		-	39	
5	89		-	66	
1	37		1	23	
1	26		-	6	
-	7		-	-	
7	202	97	1	134	99
14	55		12	33	
10	10		1	1	
4	3		3	-	
5	-		1	-	
33	68	67	17	34	67
2	4		-	1	
-	-		-	-	
13	5		10	3	
11	15		-	5	
9	7		4	2	
7	1		1	2	
15	3		8	1	
6	6		7	1	
63	41	39	30	15	33

court in the first Taifa kingdom; additional meat being provided by subadults of 1-3 years of age at the point of optimum weight.

As a working hypothesis it could be said that the sheep population structure reflected in the archaeological sample would agree with that represented in a subsistence economy where there was a seasonal shortage of grazing and no transhumance was practised. The restrictions imposed by the environmental conditions would be responsible for the foetal and newborn animals deaths. One would expect females and males to be included in this group in similar proportions. After this stage intentional culling of males that have reached an optimum weight would take place, keeping into an older age mainly ewes to fulfil the breeding requirements of the flock. The steady mortality curve without any peaks after the first year seems to be consistent with this model, in which "emphasis is put on herd security at the expense of energy productivity" (Halstead 1987b, 80).

The documentary evidence shows the difficult political and economic situation of some of these Taifa Kingdoms. The payment of taxes to their Christian neighbours is well recorded. Consequently, it appears unlikely flocks of sheep would cross Christian territories to reach the grazing lowlands of the south. More probably, the population in Albarracín kept their own flocks at a subsistence level as the age and sex profiles of the faunal remains analysed so far evidence.

The abandonment of the Castillo by the court of the Beni Razín, in period 2 is attested by the decline in the number of remains. According to the sources, a garrison troop was left on the site. The increase observed in the contribution of pigs and cattle (Table 1) at this moment could be related to the presence of the soldiers and somehow to the loss of the high status consumption habits of the previous inhabitants of the site. The sample of mandibles is smaller than for the previous period to draw definite conclusions but it does not seem a radical change in the composition of the flocks occurred (Fig. 2).

It is in period 3, with the second Taifa Kingdom and the inclusion of Albarracín in the territory of the Taifa of Murcia, when the change took place. Considering the whole sample for this period, the ovicaprids and sheep are relegated to the second position and rabbits dominate (Table 1). The age profile based on the epiphyseal and mandibular data indicates the keeping of animals into an older age (Table 3 & Fig. 2). The peak of slaughter is at stage G (4-6 years, after Payne 1973), with 42% of the sample. The sex ratio (Fig. 3), however, maintains similar proportions of males and females as in period 1. Therefore the archaeological evidence suggests that keeping a surplus of males, probably wethers into adulthood, could be afforded. The occurrence of immature animals has been reduced drastically. The structure of the archaeological population for period 3 points, on the whole, to a different management strategy of the flocks. Given that the environmental conditions were the same, it can only be concluded that winter lowland pastures were now accessible to the inhabitants of the site. The territories of Valencia and Murcia have traditionally been areas of winter grazing (Klein 1920). It is likely that the incorporation of Albarracín to the Taifa of Murcia made these pastures available to its herders and transhumance could be practised.

It seems the sheep meat consumed at the site derived mainly from mature animals, older than 4

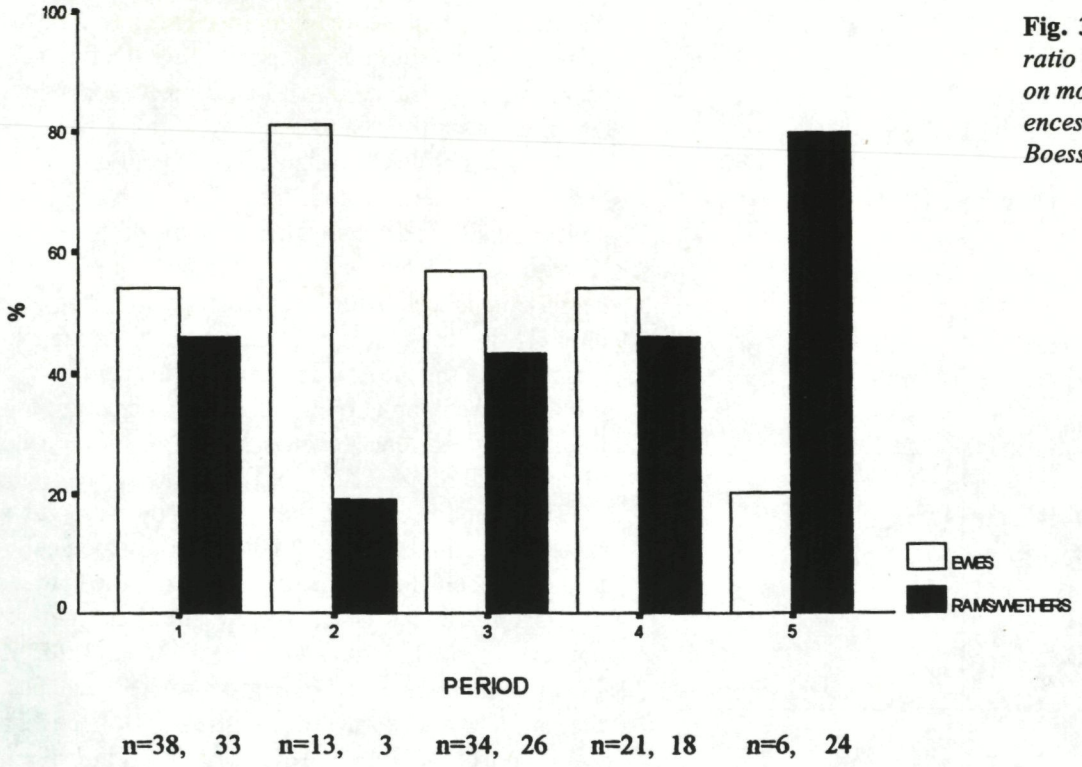

Fig. 3. - *Ovicaprid sex ratio per period, based on morphological differences of pelvis (after Boessneck 1969).*

years of age. Thus it could be argued meat production was not the first aim of keeping them but probably wool, which would be consistent with the number of wethers in the archaeological sample (Payne 1973). In addition, the slight rise in cattle remains and the large number of rabbits consumed suggest the prime role of ovicaprids as the main producers of meat had been replaced. There is a turn in this period towards a more specialised economy concerning the exploitation of ovicaprids. The opening of the frontier would have opened as well a market for a product such as wool. To an extent the new political and economic situation favoured the conditions for the introduction of a new husbandry strategy, transhumance.

The material for the Christian phase (periods 4 & 5) is not as abundant as for the Islamic one. However the sample shows the cultural change that occurred on the site. Ovicaprids are dominant but their contribution to the assemblage is in a much smaller scale (Table 1). Deer and pig are the providers of meat. Cattle and horses are consumed as well but we cannot say they were kept mainly for this use. Presumably they were kept as traction animals which after having reached a certain age could not cope with this role and were then killed for their meat. The consumption of horse could be associated with the siege the town suffered in 1284. The chronicler Desclot (Soldevila 1971) mentions that the siege was so long that even dogs and horses were consumed.

The mortality profile for the ovicaprids follows the trend started in period 3 (Fig. 2). The change observed in the sex ratio (Fig. 3) for period 5, with the dominance of males (probably wethers) against ewes would be consistent with the production of wool as the main product from sheep. By 1273 Alfonso X institutionalised the Mesta or association of shepherds. Albarracín is known to be the head of the Cuenca drover's track (Klein 1920). Therefore based on the documentary evidence it can be said that Christian Albarracín formed part of the network of a market economy. The preliminary results from the analysis on the faunal remains of Albarracín appear to agree with the historical accounts. It seems transhumance was the key factor in the shift from a subsistence to a market economy in this area.

V Conclusion

The analysis of the faunal remains from Albarracín has provided a corpus of data against which the historical evidence of transhumance could be contrasted. The mortality curves and sex ratio profiles for ovicaprids together with the estimation of the relative contribution of other species to the assemblage have been used to detect the plausible strategies under which sheep and goats have been managed within time. The environmental constraints of the area and the political and economic circumstances along the different periods appeared to have played an important role as far as the practising of one or another husbandry strategy is concerned.

As Whittaker (1988) pointed out the term transhumance cannot be used in a general way to define any seasonal movement of livestock in prehistoric and historical times ignoring factors such as specific political circumstances and the occurrence of a market for the products derived from this specialised form of pastoralism. The preliminary results described in this paper seem to be consistent with the previous conditions. The shift towards the production of a marketable product such as wool does not take place before the political circumstances settle down and there is a market to absorb such production. The Muslim community in Albarracín in periods 1 and 2 did not seem to be interested in managing their flocks for a particular product. Their basic needs were covered keeping flocks at a subsistence level.

A more detailed study to determine the season at death for the ovicaprids at the different periods is currently being done in order to confirm the preliminary results offered in this paper.

Finally, it is hoped that the present contribution has illustrated the potential the study of animal remains has for a better understanding of medieval archaeological sites and the need there is for well preserved and well excavated faunal medieval assemblages to allow comparisons at the local and regional level.

Acknowledgements

This research forms part of my PhD project funded by Clare Hall College in Cambridge. I would like to thank the Archaeozoology Lab. in the *Universidad Autónoma* of Madrid, and particularly its director Arturo Morales, for letting me use his reference collection, help and encouragement throughout the project. Finally Dr. Catherine Hills Is gratefully acknowledged for reading and correcting my English.

Bibliography

ALMAGRO M. 1959: El Señorío soberano de Albarracín bajo los Azagra, in: ALMAGRO M. (ed.), *Historia de Albarracín y su Sierra.*, vol. 3, CSIC, Instituto de Estudios Turolenses, Teruel.

ALMAGRO M. 1964: El Señorío soberano de Albarracín bajo la casa de Lara, in: ALMAGRO M. (ed.), *Historia de Albarracín y su Sierra*, vol. 4, CSIC, Instituto de Estudios Turolenses, Teruel.

BARKER G. 1990: Archaeological survey and ethnoarchaeology in the Cicolano Mountains, Central Italy, in: MAGGI R., NISBET R. & BARKER G. (eds.), *Archeologia della pastorizia nell' Europa Meridionale,* Rivista di Studi Liguri 56 (1-4), 109-121.

BATICLE Y. 1974: *L'élevage ovin dans les pays Européens de la Méditerranée Occidentale*, Paris.

BOESSNECK J. 1969: Osteological differences between sheep and goats, in: BROTHWELL D. & HIGGS E.S. (eds.), *Science in Archaeology,* 2nd ed, London, Thames and Hudson, 331-358.

BOSCH VILÁ J. 1959: El reino de taifas de los Beni Razin, hasta la constitución del señorío cristiano, in: ALMAGRO M. (ed.), *Historia de Albarracín y su Sierra*, vol. 2, CSIC, Instituto de Estudios Turolenses, Teruel.

CHANG C. 1984: The ethnoarchaeology of herding sites in Greece, *Masca Joumal* 3 (2), 44-48.

CHAPMAN R. 1979: Transhumance and megalithic tombs in Iberia, *Antiquity* 53, 150-152.

CLEARY M.C. 1986: Patterns of transhumance in Languedoc, *Geography* 71, 25-33.

CLEARY M.C. 1988: Transhumance in the Mediterranean world: the case of Languedoc 1900-1940, *Journal of Historical Geography* 14(1), 37-49.

DELANO SMITH C. 1979: *Western Mediterranean Europe*, Academic Press, London.

FRIBOURG A. 1910: La transhumance en Espagne, *Annales de Géographie* 21, 231-244.

GRANT A. 1990: Identifying and understanding pastoralism and transhumance: an archaeozoological approach, in: MAGGI R., NISBET R. & BARKER G. (eds.), *Archeologia della pastorizia nell' Europa Meridionale*, Rivista di Studi Liguri 57 (1-4), 13-20.

HALSTEAD P. 1987a: Traditional and ancient rural economy in Mediterranean Europe: plus ça change?, *Journal of Hellenic Studies* 107, 77-87.

HALSTEAD P. 1987b: Man and other animals in Later Greek Prehistory, *Annual of the British School at Athens* 82, 71-83.

HALSTEAD P. 1990: Present to past in the Pindhos: diversification and specialisation in mountain economies, in: MAGGI R., NISBET R. & BARKER G. (eds.), *Archeologia della pastorizia nell' Europa Meridionale*, Rivista di Studi Liguri 56 (1-4), 61-80.

HIGGS E. 1976: The History of European agriculture - the uplands, *Phil. Trans.* R. *Soc. London B*, 275, 159-173.

KLEIN J. 1920: *The Mesta:* A *Study in Spanish Economic History, 1273*-1836, Harvard Economic Studies 21, Cambridge, Mass.

LEWTHWAITE J. 1981: Plains tails from the hills: transhumance in Mediterranean Archaeology, in: SHERIDAN A. & BAILEY G. (eds.), *Economic Archaeology*, BAR International Series 96, 57-66.

MORALES A. 1996: A plea for recognition: faunal analysis as a historical discipline, *Arqueología Medieval* 4, 255-265.

PAYNE S. 1973: Kill-off patterns in sheep and goats: the mandibles from Asvan Kale, *Anatolian Studies* 23, 281-303.

SEMPLE E. 1922: The influence of geographic conditions upon ancient Mediterranean stock-raising, *Annals of the Association of American Geographers* 12, 3-38.

Silver I.A. 1969: The ageing of domestic animals, in: Brothwell D. & Higgs E.S (eds.), *Science in Archaeology,* 2nd ed, London, Thames and Hudson, 283-302.

Soldevila F. 1971: *Les quatre grans cròniques. Jaume I, Bernat Desclot, Ramon Muntaner, Pere III*, Barcelona.

Vidal de la Blache P. 1926: *Principles of human geography, London.*

Walker M.J. 1983: Laying a mega-myth: dolmens and drovers in prehistoric Spain, *World Archaeology* 15 (1), 37-49.

Whittaker C.R. (ed.) 1988: *Pastoral economies in classical antiquity*, The Cambridge Philological Society, Supplementary vol. 14.

Marta Moreno García
Dept. of Archaeology
University of Cambridge
Cambridge CB2 3DZ
Great Britain

Gema E. Adàn Álvarez

Consumo cárnico y comportamiento carnicero en la Asturias medieval: restos arqueofaunisticos de la Ciudad de Oviedo (Asturias, España)

1 Introducción

Las excavaciones de urgencia efectuadas desde hace unos años en Oviedo (Asturias, España), permiten disponer de un material arqueofaunístico que refleja los comportamientos y hábitos de alimentación durante la época medieval.

En concreto hemos podido analizar los restos arqueofuanísticos de un sondeo arqueológico sito en la zona W. extramuros a la ciudad, más de 200 restos entre los que se distinguieron 28 huesos identificables (Adán 1991), y otro lote procedente de la parte septentrional de la urbe que es el que vamos a especificar en las líneas siguientes (Fig. 1).

La carencia de este tipo de estudios faunísticos en Asturias coloca la presente investigación en una primera reflexión que incide tanto en el consumo de animales como en el tratamiento de carnicería.

2 Oviedo: época medieval (s. VIII-XVI)

Para centrar y contextualizar el presente análisis arqueofaunístico recordar que, en general, se acepta como origen de la ciudad de Oviedo la fecha del 761, fecha en la que se asientan en una pequeña colina los monjes Máximo y Fromestano. Más tarde, en el 781, fundarán el monasterio de San Vicente germen del crecimiento urbano medieval (García Larragueta 1962; Floriano Cumbreño 1964; Uría Ríu 1974; Rodríguez Balbín 1977; Benito Ruano 1970; Ruiz de la Peña 1992).

La existencia en Oviedo de un establecimiento romano es defendido por Fdez-Buelta y Hevia (1984), después de sus excavaciones a finales de los años 40 en la zona meridional de la Catedral (parte del palacio de Alfonso II y Cámara Santa), el palacio Arzobispal y la plaza de Canóniga. Aunque de forma confusa también parece adherirse a esta hipótesis V.J. González García (1984).

El enclave de vías que parece ser la ciudad de Oviedo, llama la atención del rey Fruela (757-768), monarca que levanta la primitiva basílica de S. Salvador. Pero el florecimiento definitivo llega de la mano de Alfonso II (759-842). Este Rey traslada la corte a Oviedo y planifica una serie de construcciones que configurarán la planimetría altomedieval de la sede regia. El inicial conjunto urbano se compondría de la reedificada iglesia de S. Salvador, la de Santa María, Panteón real, un palacio con capilla, la Cámara Santa, San Tirso e incluso un acueducto (Rodríguez Balbín 1977). Este núcleo junto con el antiguo monasterio de San Vicente se cerraría mediante una muralla de cuyo recorrido se sugieren diversas trazas (Uría Ríu 1967; Selgas 1908; Casielles 1959; Adán 1996).

Las edificaciones realizadas más adelante por Alfonso III (838-910) no parecen alterar sustancialmente el conjunto regio previo. Este monarca levanta una fortaleza extramuros, ángulo NE. del casco histórico, un palacio y otra posible cerca que tenía como finalidad preservar las nuevas construcciones adyacentes a los inmuebles religiosos de los ataques normandos (García Larragueta 1962; Floriano Cumbreño 1964; Uría Ríu 1974).

El traslado de la corte a la restaurada urbe de León (910) reduce el papel de Oviedo al de sede episcopal. Este hecho puede ser una de las razones por las que durante los siglos X y XI el crecimiento de la metrópoli se mantendrá dentro de los limes de la muralla del rey casto. La reactivación a finales del s. XI llega de la mano de la peregrinaciones al relicario de San Salvador, en estrecha relación con las jacobeas, y de la concesión del fuero otorgado por Alfonso VI y confirmado por su nieto Alfonso VII (1145). Será gracias a la política desplegada por Alfonso IX (1166/1230), y reafirmada por Alfonso X (1221/1284), cuando Oviedo transforme su primitiva fisonomía altomedieval (Ruiz de la Peña 1992), y se circunscriba a las nuevas murallas levantadas por el monarca sabio.

A pesar del incremento de suelo urbano que delimita la cerca bajomedieval, la población se asienta en zonas de extramuros, se reconocieron niveles medievales al SW., en la calle Jesús (Maradona & Martínez 1991), y, sobre todo, en las

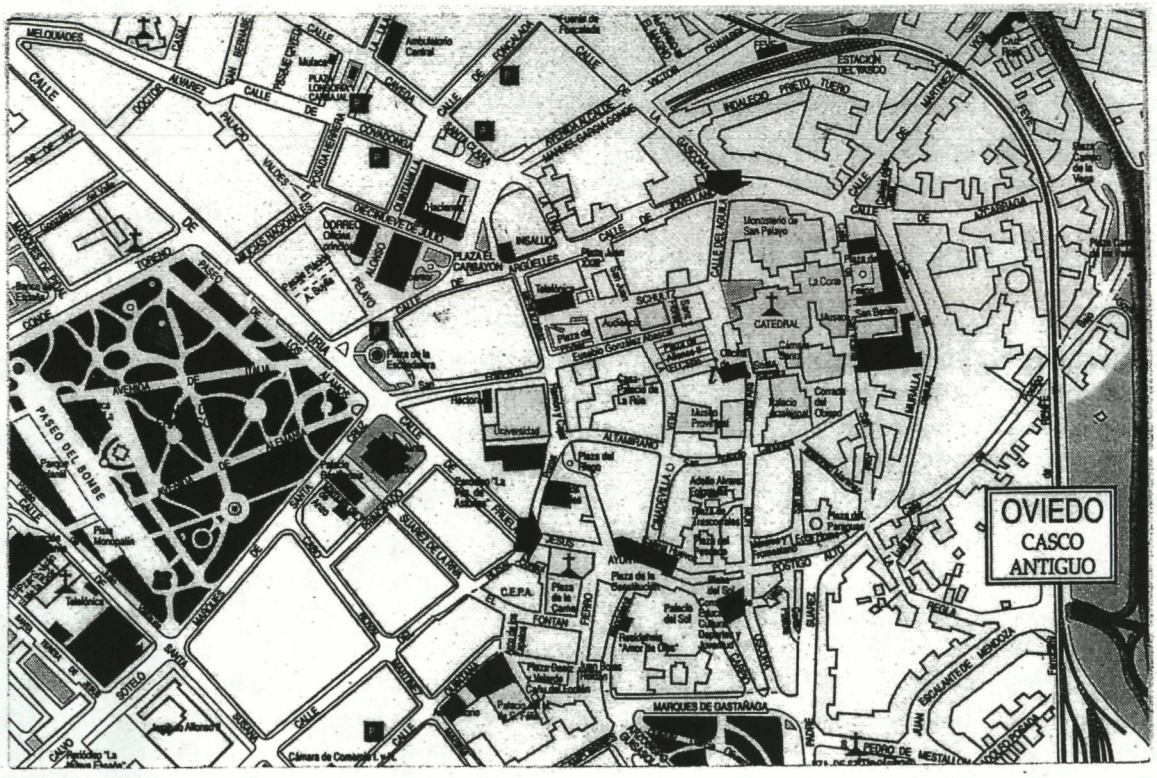

Fig. 1. - *Oviedo: zonas de recogida de material arqueofaunístico.*

prolongaciones de las rúas y de los nuevos conventos de S. Francisco y Sta. Clara (W y NW).

La ciudad se organiza ahora en varias zonas: la vieja "civitas episcopal", en torno a la Catedral y los antiguos monasterios; Socastiello, bajo el viejo castillo de Alfonso III; y el barrio mercantil, que aunque no aparece en la documentación como burgo, puede considerarse así.

Este último tiene su centro en el lugar de celebración del "azogue" – en la confluencia de las calles de la Rúa, Cimadevilla y San Antonio –, y pasará a depender, hacia el 1200, de la nueva parroquia de San Isidoro, a la que Ruiz de la Peña llama "ecclesia mercatorum". En dicha confluencia las intervenciones arqueológicas exhumaron un probable mercado bajomedieval (Ríos 1993).

Así pues, vemos como en la Baja Edad Media la vieja ciudad que vive a la sombra de la Catedral, crece y multiplica sus funciones, haciéndose su estructura más compleja merced a sus actividades comerciales, el desarrollo del grupo burgués y un aumento de población nutrido especialmente de su alfoz y las inmigraciones francas, y, en menor medida, de otras procedencias.

En los inicios de la época moderna se produce el terrible incendio de 1521. Sin embargo, a pesar del incendio y de las pestes de fines de siglo, no parece que la urbe de Oviedo permaneciese estancada (Fdez Álvarez 1977). Se emprenden traídas de agua de gran envergadura como el acueducto de los Pilares, se edifican mataderos y mercados, y se pavimentan algunas de sus calles. También se singularizan algunos de los barrios extramuros como los de La Vega y Santullano al NE, Los Estancos, El Fontán (SW), El Campo y Santo Domingo, en la zona SE.

Todas estas mejoras que influyen en la trama urbana, tendrán una clara continuidad durante la época moderna.

3 La calle del águila: secuencia estratigráfica y conjunto arqueofaunístico

A raíz de la sustitución de la red de alcantarillado cercana a la Catedral, se llevó a cabo un seguimiento arqueológico que comprendía (de norte a sur) la calle de Águila, la Plaza de Alfonso II/Catedral, y la calle de Santa Ana (Maradona *et alii* 1991). Toda esta vieja circulación de aguas trascurría por el núcleo medieval de la urbe ovetense.

Los restos arqueofaunísticos provienen de la primera parte del control arqueológico, denominado "Sector III - Cata C", sito a menos de 5 m. del posible recorrido de la cerca bajomedieval (Fig. 2). Presentaba una secuencia poco alterada por los diversos procesos postdeposicionales de carácter urbano que se sucedieron durante casi mil doscientos años en la ciudad. El resto de perfiles estratigráficos ofrecía una

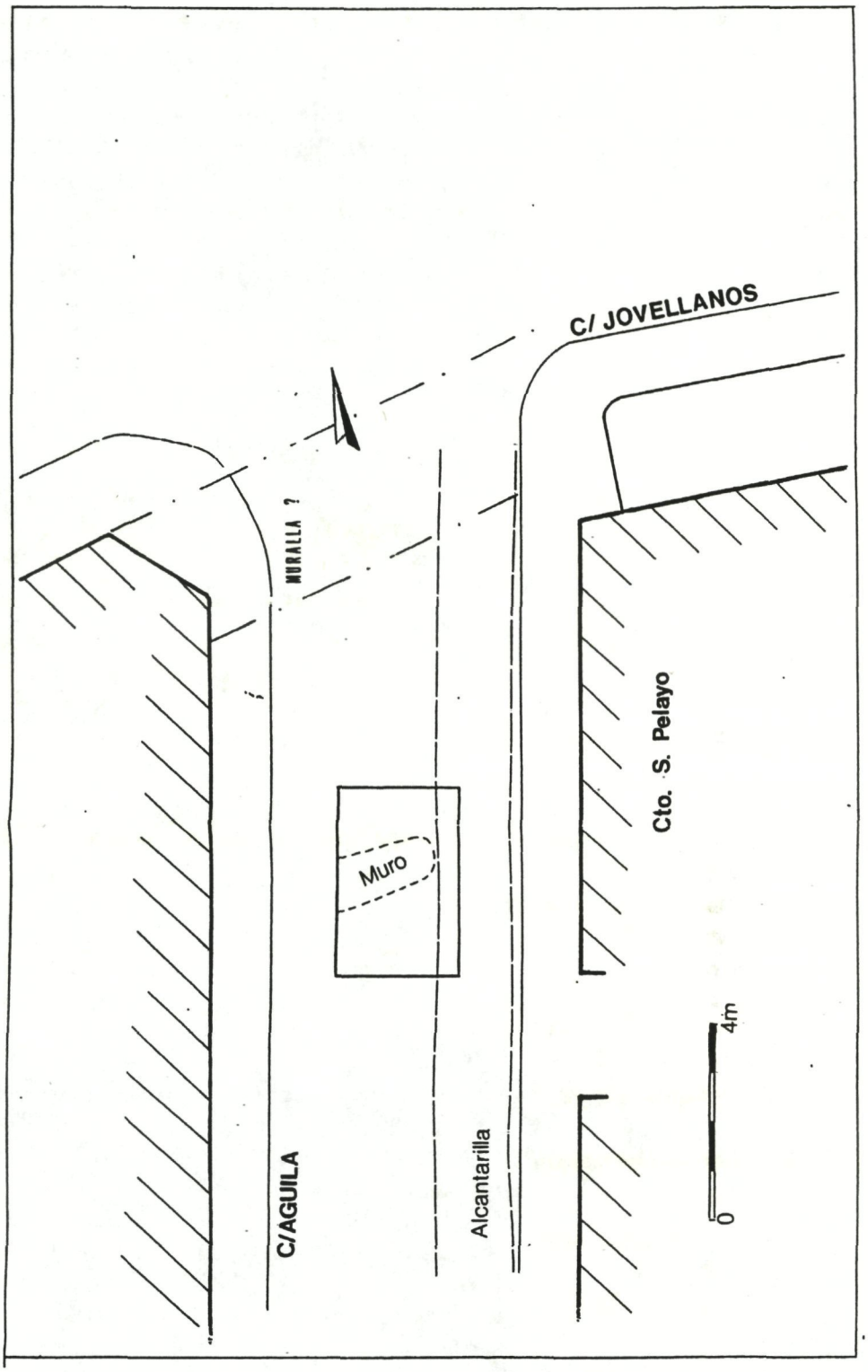

Fig. 2. - *Sondeo arqueológico de la c/ Aguila.*

complejidad que sólo se clarificaba en los estratos de las obras de alcantarillado llevadas a cabo a partor del siglo XVIII.

De los XVIII niveles identificados (reconocidos de techo a base), pertenecen a la época medieval e inicios de la fase moderna los estratos sitos bajo la pavimentación de la calle del s. XVIII (NVI y NVII). Empiezan a partir del NX y son los que siguen (Maradona *et alii* 1991, 43 y ss.) (Fig. 3):

- NX: Nivel de bastante potencia (>30 cm.), color gris-negro aunque contiene pequeñas vetas anaranjadas arcillosas. Su matriz es arcillosa plástica y húmeda y el contenido pétreo de la misma es relativamente abundante. Ofreció un buen número de material arqueológico. Se halla cortado por el NVII (preparación de pavimento) y la actual zanja de gas y está asentado sobre un posible pavimento (NXII).
- NXI: Este nivel corresponde al derrumbe del muro. Se diferencian cuatro subniveles que parecen

estar alterados por el pavimento de cantos de río (NVI y NVII).

- NXIa: sito sobre el muro en su lado N., su matriz es arcillosa de color amarillento si bien con algún aporte terroso grisáceo. Presenta pequeños fragmentos de carbón vegetal y escasos restos pétreos.
- NXIb: cubre el lado S del muro. Está formado por arcillas rojas muy plásticas y compactas así como por algún bloque grande del muro.
- NXIc: pequeña cuña incrustada bajo el NIXb de matriz terroso-arcillosa de color grisáceo y casi sin piedra.
- NXId: este nivel de derrumbe está parcialmente cubierto por los dos anteriores. Su matriz es más bien arenosa, de color amarillento con abundante piedra caliza de todo tipo de tamaños.

Los análisis posteriores permitieron precisar la cronología del muro. Su construcción pudo llevarse a cabo en la época pleno-medieval (siglos XI/XII) y seguiría en vigencia hasta la remodelación de la calle durante el siglo XVIII, cuando se emprende la construcción del actual monasterio de las Pelayas.

- NXII: Nivel que se interpretó como "suelo de ocupación". Aparece delimitado por el muro en su lado S. Es un nivel de color negro intenso que forma una capa delgada (5/10 cm.). Su matriz está compuesta por una trama muy rica en materia orgánica con abundantísimos fragmentos, pequeños, de carbón vegetal. Su textura es arcillosa y húmeda y su disposición es prácticamente horizontal. Está delimitado por el muro, y cortado por la zanja de gas y del alcantarillado.
- NXIII: Nivel sellado por los derrumbes del muro, y que sería contemporáneo al NXII, si bien su situación lo coloca en la parte "externa" del muro. Su matriz es entre arcillosa y arenosa, de color pardo-grisáceo con restos de carbón vegetal, y escasa piedra. Se sitúa por encima de un nivel de arenas estériles. Presentó un abundante cantidad de material arqueológico.
- NXIV: Cuña bajo el NXII. Su matriz es arenosa-arcillosa, de color amarillento y prácticamente carente de material pétreo. Se engrosa cerca del muro y va adelgazándose hacia el perfil Norte.
- NXV: Presente bajo el nivel anterior, se subdividió en dos tramos:
- NXVa: Nivel de color amarillento ligeramente teñido de gris. Su matriz es muy similar a la del NXIV, pero contiene algún fragmento pequeño de carbón vegetal y restos pétreos de escaso tamaño. Está cortado por la zanja del gas y secciona ligeramente al NXVI infrayacente junto al muro.
- NXVb: Es un lentejón similar en todo al tramo previo, aunque presenta más piedra y parece tener parches del NXVI.
- NXVI: Aparece bajo el NXVa/NXVb y NXIII, y es cortado por el muro y el NXV. Su matriz está formada por arenas de color pardo-grisáceo con pequeños fragmentos de carbón vegetal. Es un nivel algo suelto pero homogéneo que parece de deposición natural, siendo su composición a base de arenas estériles. Se localizaron varios materiales arqueológicos.
- NXVII: Son arenas de base de color rojizo presentes en toda la cata, con un grosor medio de 25 cm.. Estéril.
- NXVIII: Formado por arenas color amarillo-blanquecino, que apenas fueron rebajadas. Estéril.

3.1 Análisis general del conjunto Arqueofaunístico

Los datos arqueofaunísticos que aportamos proceden del análisis de las esquirlas mayores de 10 mm, localizadas en el sondeo anterior. Todo ello ha dado como resultado un estudio de 1.032 restos y 219 piezas identificadas.

Se utilizó para la determinación taxonómica los atlas de anatomía europea de Schmid (1972) y de Barone (1989). En cambio las marcas óseas y la consiguiente implicación carnicera se han traducido siguiendo las pautas dictadas por Pumarejo y Bernaldo de Quiros (1990); Pérez Ripoll (1992) y nuestras propias observaciones (Adán 1995), mientras que los cambios térmicos se han distinguido según la experimentación de Stordeur (1988). Para las señales tafonómicas hemos mantenido las definiciones de Reixach (1985), Sancho (1992) y Adán (1995).

Estas huellas, tafonómicas y de carnicería, han sido vistas y detectadas a través de una lupa de 50 aumentos, mientras que las medidas fueron tomadas con un calibre de precisión. Dichas medidas, dadas en milímetros, son una seña de identificación de los restos, ya que no están siglados, y conforman un parámetro del grado de fracturación. Únicamente hemos conjugado el Número de Restos (NR.), para obtener frecuencias relativas, y el Número Mínimo de Individuos (N.M.I.) para señalar la distinción de edad y sexo entre los materiales de la colección.

Se asume que la acumulación de restos arqueofaunísticos analizados es de procedencia antrópica, producto de actividades alimenticias, y que los huesos fueron arrojadas tanto en la zona de habitación como hacia el exterior de la posible vivienda. Por otra parte, hay una escasa aportación de huesos debida a carnívoros, pues sólo aparecieron marcas de punciones sobre una vértebra de bóvido, debidas a un perro doméstico (NXIV).

En general, el conjunto óseo no aparece muy quebrado, siendo su longitud media algo superior a

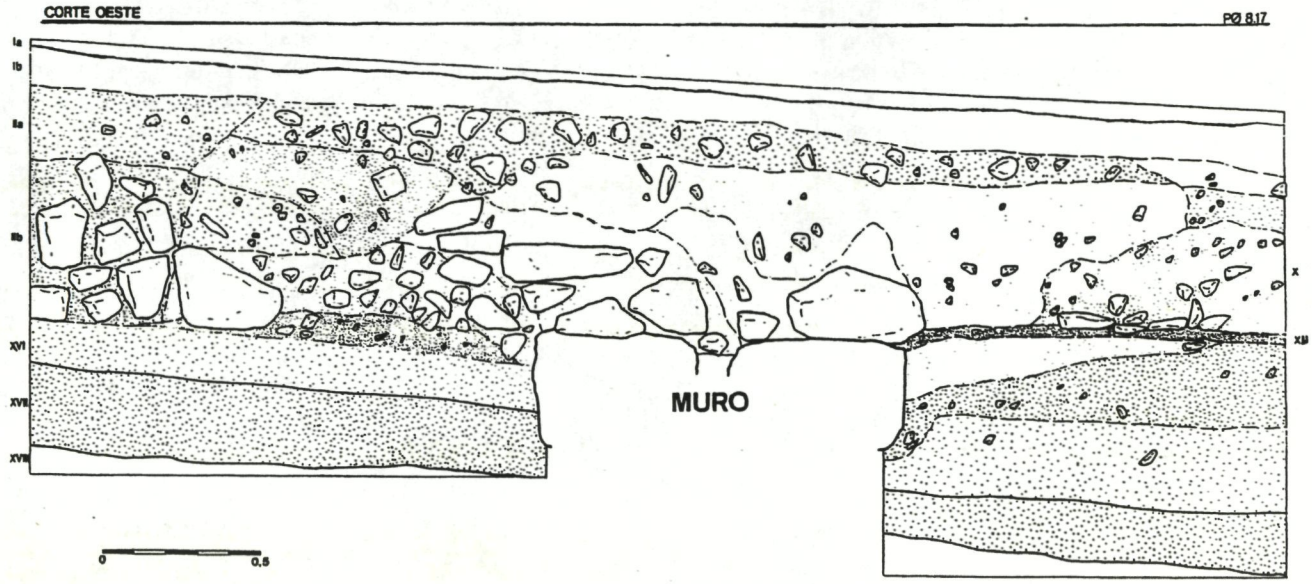

Fig. 3. - *Estratigrafía del corte oeste.*

los 50 mm., si bien las esquirlas inferiores de 30 mm. están muy presentes en toda la muestra. También se constatan leves marcas tafonómicas que nunca sobrepasan el 10% de los restos de cada nivel, siendo la mayor parte de las mismas producto de rodamientos y cloruros.

3.2 Taxonomía de restos arqueofaunísticos

Se ha procedido a la identificación de los 219 restos óseos (21,2% del conjunto total), dividiéndolos en cinco zonas de diagnóstico (Davis 1989)[1]: Cabeza - cintura escapular y articulación anterior - vertebras y costillas - cintura pélvica y extremidad posterior - falanges. De esta manera se pretende poder separar la potencial importancia económica de las diversas partes anatómicas encontradas.

Distinguimos en cada nivel:

NX (231 restos y 54 identificados): Este nivel presentaba escasos fragmentos de huesos con señales de rodamiento (1,7%), siendo la longitud de las piezas muy cercana a los 50 mm.. También reconocimos dos fragmentos de malacofauna.

- Bóvido (NR: 23 restos; N.M.I.; un adulto y un joven):
  - Cabeza: 1 resto de cuerna; 1 molar superior.
  - Cintura escapular y Articulación anterior: 1 escápula; 1 húmero.
  - Vértebras y Costillas: 9 vértebras (2 atlas y 1 caudal); 1 costilla.
  - Cintura pélvica y Extremidad posterior: 2 fémures; 5 tibias (2 izquierda, 1 derecha y 2 indeterminadas).
  - Falanges: 1 astrágalo izquierdo; 1 falange derecha intermedia.
- Ovicáprido (NR.: 23 restos; N.M.I.: 1 adulto y 1 joven):
  - Cabeza: 3 mandíbulas (1 derecha y 1 joven); 1 P1 joven.
  - Cintura escapular y Articulación anterior: 1 escápula; 3 húmeros; 1 radio.
  - Vértebras y Costillas: 9 vértebras (4 atlas, y 1 joven).
  - Cintura pélvica y Extremidad posterior: 1 fémur izquierdo; 3 tibias.
  - Falange: 1 navículo central.
- Suido (NR.: 5 restos; N.M.I.: 1 adulto y 1 joven).
  - Cintura escapular y Articulación anterior: 1 escápula; 2 húmeros (una derecha joven y otra izquierda); 1 metacarpo MIV izquierdo.
  - Cintura pélvica y Extremidad posterior: 1 ulna izquierda.
- Équido (NR.: 1 resto; N.M.I.: 1 adulto).
  - Falange: 1 carpo.
- Aves (NR.: 2 restos; N.M.I.: 1 gallus).
  - Cintura pélvica y Extremidad posterior: 1 metatarsiano.
  - Otros: 1 resto indeterminado.
- Otros: 2 restos de cráneo; 1 escápula; 4 vértebras; 78 costillas; 1 epífisis.

[1] Añadimos un quinto supuesto – Vertebras y costillas – a los definidos por DAVIS.

NXI (19 restos y 1 identificado): Como en el caso anterior, la conservación de los huesos era excelente, y la longitud de las piezas superaba los 60 mm., sin que se hubiesen apreciado huellas tafonómicas.

- Bóvido (NR: 1; N.M.I.; 1 adulto):
  - Cintura pélvica y Extremidad posterior: 1 pelvis izquierda.
- Otros: 2 escápulas; 4 costillas y 1 resto de pelvis.

NXII (176 restos y 40 identificados): La alteración tafonómica no es muy fuerte (3,4%), mostrando todo este nivel una inmejorable conservación. También se reconocieron tres fragmentos de moluscos.

- Bóvido (NR: 16; N.M.I.: 1 adulto y 1 joven):
  - Cabeza: 1 molar inferior.
  - Cintura escapular y Articulación anterior: 3 escápulas (2 izquierdas y una indeterminada); 1 radio derecho.
  - Vértebras y Costillas: 6 vértebras (2 de jóvenes).
  - Cintura pélvica y Extremidad posterior: 1 fémur izquierdo; 2 rótulas (una izquierda); 1 tibia derecha; 1 peroné derecho.
- Ovicáprido (NR.:13 restos; N.M.I.: 1 adulto y 1 joven):
  - Cintura escapular y Articulación anterior: 5 húmeros (1 joven); 2 radios (1 derecho).
  - Vértebras y Costillas: 4 vértebras (1 atlas y 1 joven).
  - Cintura pélvica y Extremidad posterior: 1 apófisis de fémur; 1 tibia derecha.
- Suido (NR: 8 restos; N.M.I.: 1 adulto):
  - Cabeza: 1 canino sup. derecho; 1 incisivo inferior.
  - Cintura escapular y Articulación anterior: 2 escápulas (1 derecha); 2 húmeros derechos; 1 radio derecho.
  - Vértebras y Costillas: 1 vértebra.
- Lepus (NR.: 3 restos; N.M.I.: 1 adulto):
  - Cintura escapular y Articulación anterior: 2 húmeros derechos.
  - Vértebras y Costillas: 1 costilla.
- Otros: 2 restos de cráneo; 1 escápula; 1 húmero; 3 vértebras; 32 costillas; 1 tibia; 1 epífisis.

NXIII (512 restos y 100 identificados): Es el nivel donde más restos arqueofaunísticos aparecieron, si bien casi no se distinguieron señales tafonómicas. Por contra se aprecia una gran fragmentación que merece la pena destacarse, ya que casi el 50% de la muestra es menor de 30 mm. Como en el nivel anterior, también aquí se rescataron cinco fragmentos de malacofauna.

- Bóvido (NR: 52 restos; N.M.I.: 2 adultos, uno es de hembra, y 1 joven).
  - Cabeza: 9 fragmentos de cuerna; 1 M3 inferior izquierdo; 2 M2 inferior (derecho e izquierdo); 1 M1 inf. derecho; 3 M2 sup. (2 derechos); 2 M1 sup. derecho; 1 P2 sup. derecho; 3 incisivos (2 izquierdos); 7 fragmentos de mandíbula (4 izquierdas, 3 derechas y 1 joven); 1 maxilar; 2 huesos oideos.
  - Cintura escapular y Articulación anterior: 3 escápulas (1 derecha y 2 indeterminadas); 4 húmeros (1 izquierdo, otro derecho y 2 indeterminados)
  - Vértebras y Costillas: 1 vértebra; 4 costillas.
  - Cintura pélvica y Extremidad posterior: 1 tibia; 1 apófisis de radio joven.
  - Falanges: 1 proximal derecha; 2 intermedias (1 derecha y otra izquierda); 2 distal (1 derecha y otra izquierda); un resto indeterminado.
- Ovicáprido (NR: 30 restos; N.M.I.: 4 adultos y 1 joven):
  - Cabeza: 1 M3 sup. izq.; 1 M1 sup. der.; 9 restos de mandíbula (2 izq. 5 der. y 2 indeterminados).
  - Cintura escapular y Articulación anterior: 5 restos de escápula (3 derechas, 1 izquierda y 1 de joven); 1 húmero.
  - Vértebras y Costillas: 4 vértebras (1 caudal y 1 de joven).
  - Cintura pélvica y Extremidad posterior: 2 restos de pelvis (1 de lado izquierdo); 2 restos de coxis; 1 tibia derecha; 2 metápodos (1 izquierdo y otro joven).
  - Falanges: 1 calcáneo; 1 falange indeterminada.
- Suido (NR: 8 restos; N.M.I.: 1 adulto macho):
  - Cabeza: 1 canino macho; 1 mandíbula izquierda.
  - Cintura escapular y Articulación anterior: 1 escápula derecha; 4 húmeros (2 derecho y 2 izquierdo); 1 metacarpo M1 izquierdo.
- Ave (NR: 4 restos; N.M.I.: 1 posible gallus):
  - Cintura pélvica y Extremidad posterior: 1 metatarsiano.
  - Indeterminados: 3 restos.
- Équido (NR: 1; N.M.I.: 1 adulto):
  - Cintura escapular y Articulación anterior: 1 escápula derecha.
- Ciervo (NR: 2 restos; N.M.I.: 1 adulto):
  - Cabeza: 1 M4 inf. izquierdo; 1 P3 inf. izq.
- Canido (NR: 3 restos; N.M.I.: 1 adulto y 1 joven):
  - Vértebras y Costillas: 3 vértebras (1 joven).
- Otros: 5 restos de cráneo; 2 dientes; 10 restos de mandíbulas; 1 maxilar; 3 restos de escápulas; 38 costillas; 14 vértebras; 1 pelvis.

NXIV (22 restos y 4 identificados): Toda la muestra estaba formada por restos óseos cuya longitud media no alcanzan los 40 mm.. A parte de las punciones de

perro señaladas con anterioridad, hemos podido reconocer pocos huesos con marcas (9,1%).

- Bóvido (NR: 4 restos; N.M.I.: 1 adulto):
  - Vértebras y Costillas: 1 vértebra.
  - Cintura pélvica y Extremidad posterior: 1 fémur.
  - Falanges: 1 calcáneo.
- Otros: 1 vértebra y 7 costillas.

NXV (55 restos y 13 identificados): En este caso también la colección se componía mayoritariamente de huesos de pequeño tamaño (media 38 mm.). Aparecieron sólo unos pocos restos óseos rodados (1,8%).

- Bóvido (NR.: 2 restos; N.M.I.: 1 adulto):
  - Cabeza: 1 resto de mandíbula.
  - Vértebras y Costillas: 1 vértebra.
  - Ovicáprido (NR.: 11 restos; N.M.I.: 3 adultos y 1 joven):
  - Cabeza: 3 fragmentos de mandíbula; M3 inferior de leche.
  - Cintura escapular y Articulación anterior: 3 húmeros (izquierdo, derecho e indeterminado).
  - Vértebras y Costillas: 2 costillas.
  - Cintura pélvica y extremidad posterior: 1 tibia derecha.
  - Falanges: 1 astrágalo.
- Otros: 5 costillas y 1 vértebra.

NXVI (17 restos, 7 identificados): Los escasos restos son bastante grandes (media de 50 mm.), y todo el conjunto presenta marcas de rodamiento y cloruros (29,4%), pues no hay que olvidar la composición de la matriz geológica en la que se hallaban.

- Bóvido (NR: 3 restos; N.M.I.: 1 adulto):
  - Vértebras y Costillas: 1 vértebra y 1 costilla.
  - Cintura pélvica y Extremidad posterior: 1 fémur derecho.
- Ovicáprido (NR: 4 restos; N.M.I.: 1 adulto y 1 joven)
  - Vértebras y Costillas: tres vértebras, 1 de joven.
  - Cintura pélvica y Extremidad posterior: 1 tibia.
- Otros: 3 costillas indeterminadas.

3.3 Tratamiento carnicero y térmico

Aunque se va a especificar el trabajo carnicero de cada nivel, señalar con brevedad que hemos reconocido muy pocas marcas de dicha actividad y que están son, generalmente, muy finas y suaves. De diseño longitudinal, aparecen de manera aislada y no conforman grupos como es característico en las señales debidas a piezas líticas y a útiles de las primeras fases metálicas. Parece como si el material de hierro de la época medieval seccionase con mayor precisión y el periostio se cortarse con más facilidad.

Las huellas de fuego o culinarias son también escasas, casi siempre de un color marrón claro (300º) que quizás indiquen una predilección por la cocción de las partes cárnicas que están adheridas a los huesos rescatados. No se identifican claramente partes que hayan sido expuestas directamente en el fuego (625º-645º), es decir, piezas cárnicas con hueso que se eligen para asar.

Como dijimos, en cada nivel observamos:

- NX.: Hay 12 restos (5,2% del total del nivel) con señales de quemado, sobre costillas, mandíbulas, húmeros etc. Por contra las marcas de carnicería se circunscriben a líneas de descarnación (9 restos - 3,2% del nivel), casi siempre en costillas; extracción de grasa, sobre fémur de bóvido (1 resto - 0,4%) y una marca de despiece en vértebra (1 resto - 0,4 %).
- NXI.: Entre tan escasos huesos, sólo hemos distinguido cuatro fragmentos quemados (21,2% del nivel) y dos marcas de descarnado (10,5% del nivel) una sobre una pelvis y otra sobre costilla.
- NXII.: Se reconocieron siete restos con tratamiento térmico (13,1% del nivel), la mayor parte sobre costillas. Asimismo, se hallaron 3 huesos (1,7% del nivel) con marcas de descarnado, alguna sobre tibia; 2 de desarticulación (1,1%) en radio de ovicáprido; y una de despiece (0,5%) sobre vértebra.
- NXIII.: A pesar del gran número de restos, sólo hemos distinguido 45 huesos quemados (8,8% del nivel). Como en los otros casos, la mayor parte de los mismos se localizaban sobre costillas, metápodos, húmeros, escápulas, alguna vértebra y mandíbulas, con dientes, de ovicáprido. El resto de marcas de carnicería se distribuyen en: 4 de despiece (0,8% del nivel); 1 de desarticulación (0,2%); 1 de despellejamiento (0,2%); 3 de descarnado (0,6%) y 1 con extracción de grasa (0,2%).
- NXIV.: En este caso no reconocimos ningún hueso quemado y sólo dos portan huellas de descarnación (9,1% del nivel), una sobre fémur de bóvido y otra sobre costilla.
- NXV.: Se localizaron 8 restos con tratamiento térmico (14,5% del nivel); y sólo 2 con incisiones longitudinales de descarnado (3,6% del nivel) sobre costillas.
- NXVI.: Proporcionalmente, es el nivel donde más huesos quemados hemos identificado, unos 6 que corresponden al 35,5% del total. Sin embargo sólo hemos reconocido 1 marca de descarnado (5,8% del nivel) sobre fémur de bóvido.

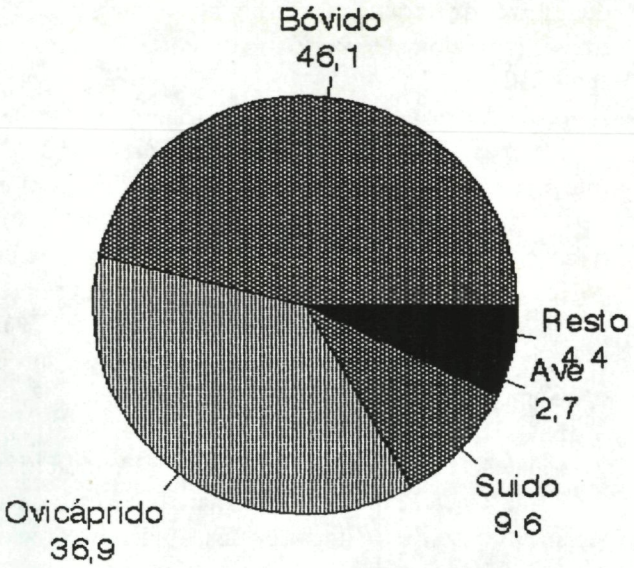

Fig. 4. - *Distribución arqueofaunística (porcentajes).*

3.4 Consideraciones sobre la fauna y las actividades de carnicería y culinarias

El material óseo analizado corresponde a un dilatado tiempo, siglos XII/XIII a siglo XVIII. Durante estos 600 años pocos son los datos que certifiquen un cambio sustancial en la elección del alimento y los comportamientos alimenticios consiguientes. De toda la información estudiada, destacaríamos, por su número y conservación, el conjunto de huesos localizado en el NXIII (49,6% del total de la muestra). Como hemos visto corresponde a un nivel de suelo de calle, y pudiera estar reflejando una costumbre muy extendida en la ciudades amuralladas hasta que se emprende la pavimentación, como era la de arrojar los desperdicios directamente a la rúa. También destaca el volumen de restos localizados en el piso de la vivienda (NXII, con 17,1% del conjunto óseo), y los que podrían corresponder a la destrucción de la casa adosada a la muralla y la construcción del alcantarillado (NX), que comprende el 22,4% del material analizado.

Sobre los mamíferos y aves que se han documentado, poca variaciones descubrimos en toda la secuencia estratigráfica (Fig. 4). El predominio, tanto porcentual (46,1% del total, que llega a ser del 52% en el NXIII) como de valor cárnico que suponen los restos de bóvidos, eclipsa el resto de especies representadas. A continuación en la lista de animales domésticos, aparecen los ovicápridos (36,9% del total), y pudiera ser que la mayor parte del conjunto fuese de oveja. Con los suidos (9,6% del total), sin que existan datos que nos lleven a decantarnos por el cerdo doméstico o el jabalí, así como con las aves (2,7% del total) y el équido (0,9%), se completa el listado faunístico. Además hemos reconocido unos restos de caza, ciervo (0,9%) y una posible liebre (1,3%), junto con otros fragmentos de perro doméstico en el NXIII.

También constatamos la presencia de malacofauna, posiblemente patella, si bien su número es muy bajo y por tanto poco significativo. La propia forma de selección de la muestra faunística ha impedido reconocer otras especies faunísticas, como de ictiofauna por ejemplo.

Argüello (1996) rescata unas ordenanzas del siglo XIII (1274) en la que se especifican los precios y la procedencia geográfica de los animales que eran puestos en venta en los mercados ovetenses. Los más baratos parecen ser las piezas de vaca/buey, así como el cerdo que se mataba en la misma ciudad, y el

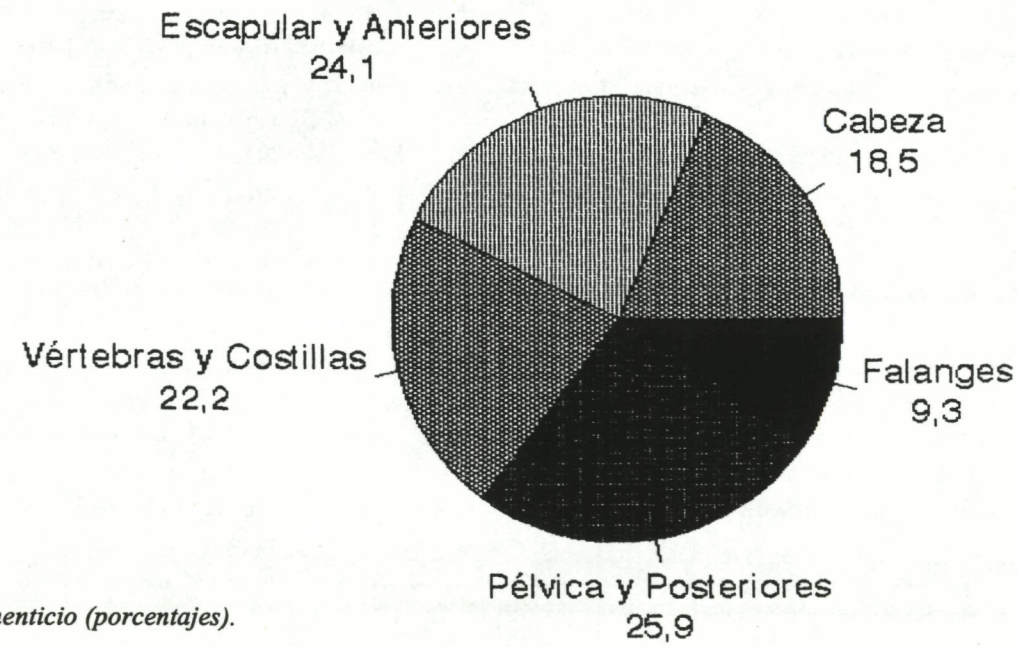

Fig. 5. - *Tratamiento alimenticio (porcentajes).*

carnero de Asturias. Por contra alcanzaban precios considerables los carneros de Campos (Castilla).

Las partes anatómicas reconocidas nos certifican el traslado del mamífero entero a la vivienda. Sin embargo, no hemos reconocido muchas marcas de despiece con lo que aventuramos la hipótesis de que se trasladaban a los hogares, posiblemente desde mercados centrales, las diversas zonas alimenticias ya previamente seccionadas. Esto podría explicar la escasez de los huesos de manos y patas (carpos, tarsos y falanges), y el posible despellejamiento previo en la zona de venta de la carne[2] (Fig. 5).

De forma genérica, se comprueba como de los Bóvidos se consume paletilla/pecho, solomillo, costillas, y pierna. También aparecieron restos de cuerna y de falanges que demuestran la presencia de todas las partes del animal en la despensa. De los ovicápridos también se seleccionan paletilla y pecho, lomo y piernas. Asimismo, los suidos aparecen en la muestra con diversas zonas cárnicas: aguja, paletilla/pecho y lomo/tocino. Más aislada se refleja la presencia de caballo (pecho y pata), aves (zancas), ciervo (cabeza), y liebre (patas). Sin embargo dentro del resto de material que no fue identificable faunísticamente, destaca el gran número de filetes/costillas que reflejan una cierta preferencia culinaria y, por tanto, la adquisición selectiva de dichas partes cárnicas. Sabemos por las ordenanzas anteriores (Argüello 1996) que estas zonas eran las más baratas.

También podemos constatar como se procesaban en la cocina dichas partes anatómicas. De forma mayoritaria las huellas de descarnado sobresalen del resto de marcas (23 huesos, 65,7% del total de señales), tanto sobre costillas, las mayoritarias, como en el resto de huesos largos (tibia, fémur) y planos (escápula y pelvis). A continuación siguen las de despiece (6 restos, 17,1%), sobre vértebras, mandíbulas y coxis, y ya más igualadas el resto de estigmas carniceros: desarticulación (3 restos, 8,6%), despellejamiento (1 resto, 2,8%)[3] y extracción de grasa (2 restos, 5,7%).

Ya hemos comentado como casi todas las marcas de carnicería son muy delgadas y poco marcadas, pues parece que el "cuchillo carnicero" secciona y rompe el hueso sin dificultad y las que encontramos pueden deberse simplemente al extremo cortante o filo adelgazado. De ahí la abundancia de secciones transversales y longitudinales de los huesos que pudieran certificarnos este corte limpio del útil metálico. Por otra parte la abundancia de huesos pequeños también pudieran explicarse mediante una rotura selectiva debida al consumo humano. Sin embargo, el bajo número de las marcas óseas carniceras (3,4% del total) nos está indicando una alimentación cárnica una vez que ya se ha eliminado el "soporte" que implica el hueso.

Las siguientes prácticas culinarias, identificadas mediante las señales de tratamiento térmico, reflejan una preferencia por el cocido o hervido frente al asado o ruste. Y si vemos nivel por nivel, llama la atención el alto porcentaje de restos cocinados en el NXII (suelo de vivienda), un 13,1% del total de huesos del nivel, por el número del NXIII (suelo de calle) con un 8,8%. Sin embargo no creemos que estas cifras estén reflejando una cremación de los mismos para su eliminación como basura, a pesar de ser una práctica conocida en otros lugares arqueológicos (Colomer *et alii* 1996).

4 Secuencia del consumo cárnico y comportamiento carnicero y culinario durante la época antigua y medieval en Asturias

Los análisis presentados en las páginas precedentes son un mero reflejo, pálido por la carencia de otros estudios similares, de los animales que se consumían durante la época medieval y del tratamiento posterior dado a los mismos por parte de los pobladores medievales de la urbe ovetense. Faltan más datos arqueofaunísticos de lo que acontecía en las ciudades y sobre todo la contrastación con lo ocurría en otro ámbito fundamental: el medio rural. Sin olvidar que este comportamiento se debe incluir en una secuencia histórica que vaya reflejando y explicando la elección faunística tanto en el contexto económico como en las actividades de carnicería y culinarias.

Por otra parte el desconocimiento de la fauna y de sus formas de consumo posteriores no es exclusivo de los tiempos medievales y la encasez de estos análisis desde la época paleolítica en Asturias es altamente significativo.

Los estudios faunísticos de la fase antigua (protohistoria) aparecen durante la denominada "Cultura Castreña" y pertenecen fundamentalmente a dos yacimiento, el castro de Llagú (Latores, Oviedo), muy cercano de la ciudad de Oviedo, y el castro de Caravia (Caravia). En este último yacimiento, con ocupación probable desde el s. V a.C., reconocimos

[2] No podemos llevar hasta las últimas consecuencias esta apreciación, pues durante la excavación bien pudo no haberse recogido estos huesos pequeños.

[3] No conviene olvidar que los cueros de los animales eran un negocio muy rentable, y que estas pieles debían conservar, en un primer momento, falanges y cráneos (Argüello 1996).

piezas de cápridos y fundamentalmente especies de caza como el jabalí y por supuesto el ciervo (Maya 1989; Adán *et alii* 1995). El castro de Llagú[4], con ocupación prerromana (pos. S. III a.C.) y romana, también certifica una abundante presencia de especies cazadas (ciervo, corzo, cabra ibex y jabalí), y un menor cómputo de domésticas como bóvido y ovicápridos. En todas estas piezas se reflejan marcas de carnicería (despiece, desolle y descarnación) y también son la materia prima a la que se da forma a un importante utillaje óseo parecido al celtibérico (mangos, fichas, fusayolas etc.) y a otro propio de los indígenas romanizados.

Ya en época romana, contamos la simple enumeración de restos arqueofaunísticos y la nula referencia a las transformaciones siguientes. El primer dato proviene de Alvargonzález (1906) y su excavación en Gijón, Termas Romanas. Este investigador cita la presencia de colmillos de jabalíes, cuernas de bóvidos, astas de ciervo y astas de cabra, y también menciona cuernos de bóvidos y cabras en una villa romana de Las Isla (Colunga). Una continuidad en la selección faunística que aún está por perfilar, ya que si bien aparecen citada la misma cabaña ganadera y cinegética, las proporciones de ambas y su consumo, con los datos actuales, no se puede averiguar.

Por último, si hasta este momento nos podían parecer escasos y aleatorios los datos faunísticos, más raros son aún los vestigios óseos analizados de la fase medieval, y éstos se circunscriben a espacios urbanos bajomedievales. En Oviedo (Adán 1991) hemos podido detectar la presencia de ovicápridos, bóvidos, aves domésticas (gallina) y pocos restos de liebre/conejo. Casi todos los huesos presentaban marcas de un instrumental metálico, con tratamiento de cocción y asado. Todos estos datos no varían el análisis aquí presentado aunque somos conscientes de que todavía nos movemos en el terreno de las hipótesis.

Encuadrando estos estudios en el marco perfilado para la península ibérica durante la Edad Media (Morales *et alii* 1992; Blay 1987 etc.), se observa una coincidencia faunística, sin barajar proporciones en las especies, composición ganadera, formas de adquisición cárnica..., mientras que es total el desconocimiento en las prácticas o actividades de carnicería y culinaria., por la inexistencia de análisis similares.

En definitiva, se van dando pequeños pasos y entreabriendo campos de investigación que aún son, claramente, minoritarios.

Bibliografía

ADÁN ÁLVAREZ G.E. 1991: Estudio Arqueofaunístico de la excavación en C/ Jesús (Oviedo), en: MARADONA J.A. & MARTÍNEZ L., *Excavaciones Arqueológicas de la C/ Jesús (Oviedo)*, C.E.C., Oviedo.

ADÁN ÁLVAREZ G.E. 1995: *Industria ósea del tardiglaciar en Asturias: análisis arqueozológico y estudio de los métodos de trabajo sobre el utillaje óseo*, Tesis de Doctorado, Universidad de Salamanca (inédita).

ADÁN ÁLVAREZ G.E. 1996: La muralla de Oviedo: construcción, arreglos y desarreglos, en: *I Congreso Nacional de Historia de la Construcción*, Instituto Juan Herrera y CEHOPU, Madrid, 5-12.

ADÁN ÁLVAREZ G.E., MARTÍNEZ L. & DÍAZ F. 1994: Limpieza estratigráfica del castro de Caravia (Caravia, Asturias): reconstrucción arqueológica/ histórica, *Zephyrus* XLVII, Universidad de Salamanca, 343-352.

ALVARGONZÁLEZ C.1906 (ed. 1965): *Las termas romanas de Campo Valdés*, Gijón.

ARGUELLO J.J. 1996: *Artesanos y producción artesanal en el país asturiano en la Edad Media*, Tesis Doctoral, Universidad de Oviedo (inédita).

BARONE R. 1989 (3° Ed): *Anatomique comparée des Mammifères domestiques*, Paris.

BENITO RUANO E. 1970: El desarrollo urbano en Asturias en la Edad Media. Ciudades y Polas, *B.I.D.E.A.* 69, 159-180.

BLASCO SANCHO Mª.F. 1992: *Tafonomía y Prehistoria*, Depto. de Ciencias de la Antigüedad, Universidad de Zaragoza.

BLAY GARCÍA F. 1987: Aprovisionamiento cárnico en Torrent (Valencia) al final de la Edad Media", en: *II Congreso de Arqueología Medieval Española. Madrid. 1987*, Madrid, 35-42.

CASIELLES R. 1959: Las cercas de Oviedo, *B.I.D.E.A.* XXXVII, Oviedo, 294-307.

COLOMER E., MONTÓN S. & PIQUE R. 1996: *Técnicas arqueológicas sobre actividades de subsistencia en la Prehistoria*, Madrid.

CLUTTON-BROCK J. 1987: *Domesticated Mammals*, British Museum, Londres.

DAVIDSON I. & ESTEVEZ J. 1986: Problemas de arqueotafonomía. Formación de yacimientos con fauna, *Quaderns 1985/86*, Girona, 67-87.

DAVIS S.J.M. 1989: *La Arqueología de los animales*, Barcelona.

[4] ADÁN ALVAREZ G.E. 1996: Material óseo de "Castiellu de Llagú" (Latores, Oviedo), en: RUIBAL J. & GLEZ M.L., *Primera Fase de excavación en Castiello de Llagú (Latores, Oviedo)*, Consejería de Cultura del Principado de Asturias, Oviedo (inédito).

ESTEVEZ J. 1983/84: Sobre la valoración de restos arqueofaunísticos en yacimientos arqueológicos, *Empuries* Nº 45/46, Barcelona, 42-53.

ESTEVEZ J. 1988: Cuestiones de Fauna en Arqueología, en: *Nuevas Tendencias. Arqueología*, Barcelona, 57-82.

FERNÁNDEZ ÁLVAREZ M. 1977: *Historia de Asturias. Edad Moderna I*, Salinas.

FDEZ-BUELTA J. & HEVIA V. 1984: *Ruinas del Oviedo primitivo*, Oviedo.

FERNÁNDEZ UGALDE A. 1994: El fenómeno del relleno de silos y la implantación del feudalismo en Madrid y en el reino de Toledo, en: *IV Congreso de Arqueología Medieval Española. Alacant 1993*, Alicante, 611-617.

FLORIANO CUMBREÑO A. 1964: Origen, fundación y nombre de Oviedo, en: *Simpósium sobre cultura asturiana de la Alta Edad Media*, Oviedo, 167-190.

GARCÍA LARRAGUETA L. 1962: *Col. de doc. de la Catedral de Oviedo*, Oviedo.

GONZÁLEZ GARCÍA V.J. 1984: *El Oviedo antiguo y medieval (estudio histórico arqueológico sobre los orígenes y la formación de la ciudad)*, VII Sancta Ovetensis, Oviedo.

MARADONA J.A., MARTÍNEZ L. & ALONSO Mª.R. 1991: *Obras de saneamiento de la Catedral, Oviedo. Seguimiento arqueológico*, Ayuntamiento de Oviedo, Oviedo (inédito).

MAYA J.M. 1989: *Los Castros en Asturias*, Gijón.

MORALES A. 1987: Problemas de interpretación de los datos faunísticos procedentes de los yacimientos arqueológicos, *Arqueología Medieval Española* II, Madrid, 33-45.

MORALES MUÑIZ A. 1988: On the use of butchering as a paleocultural index: proposal of a new methodology for the study of bone fracture from archaeological sites, *Archaeozoologia* II (1.2), Bordeaux, 111-150.

MORALES A. 1989: Zooarqueología, en: *Paleontología*, Madrid, 381-410.

MORALES MUÑIZ A. 1990: Arqueozoología teórica: usos y abusos reflejados en la interpretación de las asociaciones de fauna en yacimientos antrópicos, *Trabajos de Prehistoria* Nº 47, Madrid, 11-15.

MORALES A., AGUILAR A.L., MORENO R., ROSELLO E. & CEREIJO M.A. 1992: Calatrava La Vieja: la fauna, en: *III Congreso de Arqueología Medieval de España. Oviedo 1989*, Oviedo, 63-72.

PÉREZ RIPOLL M. 1992: *Marcas de carnicería, fracturas intencionadas y mordeduras de carnívoros en huesos prehistóricos del Mediterráneo español*, Inst. "Juan Gil Albert", Alicante.

PUMAREJO P.G. & BERNALDO DE QUIROS F. 1990: Huellas humanas en Huesos. Análisis de sus implicaciones, *Revista de Arqueología* Nº 108, Madrid, 16-24.

REIXACH J. 1986: Huellas antrópicas: metodología, diferenciación y problemática, *Revista de Arqueología* Nº 60, Madrid, 6-14.

RÍOS GONZÁLEZ S. 1993: *Memoria del seguimiento arqueológico de las obras de renovación de pavimentos de las calles Cimadevilla, S. Antonio, Oscura, Món, Máximo y Fromestano, Santa Ana, Canóniga, Peso y Huevos así como de las plazas de la Constitución y Trascorrales. Oviedo 1992*, Memorias de la C.E.C.D.J. de Oviedo.

Rodríguez Balbin H. 1977: *Estudio sobre los primeros siglos del desarrollo urbano de Oviedo*, Universidad de Oviedo.

RUIZ DE LA PEÑA J.I. 1992: Los orígenes urbanos de Oviedo: morfología de la ciudad medieval, *Oviedo en el recuerdo*, Oviedo.

SCHMID E. 1972: *Atlas of animal bones for prehistorians, archaeologists and Quaternary geologists*, Londres.

SELGAS F. 1908: *Monumentos ovetenses del s. IX*, Madrid.

SHERRAT A. 1981: Plough and pastoralism aspects of the secondary products revolution, *Pattern of the past (studies in honour of David Clark)*, Cambridge University Press, 261-305.

STORDEUR D. 1988: *Outils et Armes en Os du Gisement Natoufien de Mallaha (Eynan) Israel*, Assosiation Paléorient, Paris.

URÍA RÍU J. 1967: Cuestiones histórico-arqueológicas relativas a la ciudad de Oviedo de los siglos VIII al X, en: *Simpósium sobre Cultura asturiana en la Alta Edad Media*, Oviedo, 261-328.

URÍA RÍU J. 1974: Orígenes y desarrollo de la ciudad, *El libro de Oviedo*, 21-61.

VV.AA. 1996:. *Arqueozoología: economia i societat. Cota Zero* Nº 11, EUMO Editorial Vic, Barcelona.

Siglas

B.I.D.E.A. Boletín del Instituto de Estudios Asturianos.

C.E.C. Consejería de Educación y Cultura.

C.E.C.D.J. Consejería de Educación, Cultura, Deportes y Juventud.

CEHOPU. Centro de Estudios Históricos de Obras Públicas y Urbanismo.

I.D.E.A. Instituto de Estudios Asturianos.

Gema Adán Álvarez
San Pedro de Mestallón
33009 Oviedo
Principado de Asturias
España